THE INDEPENDENT GUIDE TO **IBM** PERSONAL COMPUTERS

PC

Volume 3 Number 14
$2.95

July 24, 1984

In PC News:
PORTABLES
Take New Shape

Unlimited Visions

Computer-Aided Design for your IBM



IBM's Hi-Tech Competition: Don't Get Even, Get MAD

Jack 2: A Giant Killer?

DATA BASE Onward And Upward: 9 More Products Rated

Envision's Incredible VectorPrinter

The IBM And the Casino

0 14024 14355 30

Smoother Connections With PFS:ACCESS

Preview: Microsoft's DOS Bible

Copyrighted material

CONDOR jr.
Data Management Software



Condor's IBM™ PC-compatible file management software is one of the easiest and most complete MENU assisted file managers today, and for just $195.

Would you buy a file manager that can't add two numbers? Of course you wouldn't. PFS FILE™ contains no arithmetic capability and can't even balance a checkbook!

Condor jr. offers all the benefits of PFS FILE™ ***plus*** *the ability to easily balance your checkbook, total your purchase orders, average grades and even monitor your tax deductible expenses. This is in addition to your normal mailing list and other file management tasks. Unlike PFS FILE™, Condor jr. also offers* ***report writing*** *at no additional cost.*

Condor jr. allows you to upgrade to Condor3 and save money as your needs grow. You can move to a fully relational database without redoing your system. A $195 discount off Condor3 also makes it easier.

Since Condor has years of data management experience — we have a proven growth path for you. Condor jr. has been especially designed for the first time user. Not surprisingly, it is designed directly from Condor 3 — a fully relational database that is being used in over 100,000 businesses today.

To find out more about Condor jr. and the demonstration-pack software, see your personal computer dealer, or call ***1-800-221-8479*** *(in Michigan call* ***0-313-769-3992*** *collect) for the dealer nearest you.*



IBM is the registered trademark of International Business Machines Corp.
PFS File is the registered trademark of Software Publishing Corp.

CIRCLE 300 ON READER SERVICE CARD

condor
2051 South State Street Ann Arbor, MI. 48104 313-769-3988

Copyrighted material

UCSD PASCAL® NOW HAS WINDOWS

CREATE EXCITING WINDOW PRODUCTS IN THE LANGUAGE EVERYONE SPEAKS FOR A PRICE THAT SPEAKS FOR ITSELF.

It's easy. It's quick. And now with this special offer, it's very inexpensive.

We started with UCSD Pascal and the p-System™—the world's best integrated software development environment. Then we made it even better.

We added Insight Window Designer™. This powerful tool kit can save you thousands of lines of code and hundreds of hours of programming.

You can create and execute your application on almost any microcomputer with at least 64k memory, including the IBM® PC, IBM XT, IBM PCjr., Apple™ IIe, and DEC Rainbow™.

You'll move windows, select from a palette of colors, edit and transfer text, employ pick lists, create hierarchical menus, provide on-line help and develop integrated applications.

But what's really amazing is the price.

While this special introductory offer lasts, you get SofTech Microsystems' UCSD Pascal compiler, the p-System operating system and Insight Window Designer, all for only $399. That's almost half price.

And if you already use UCSD Pascal and the p-System, you can add Insight for only $99.

Call or write. We'll tell you all about it. But with a package price like this, why not order today?

Contact: End User Sales,
SofTech Microsystems,
16885 West Bernardo Dr.,
San Diego, CA 92127
619/451-1230

SPECIAL $399 OFFER EXTENDED TO AUGUST 1, 1984

SOFTECH MICROSYSTEMS

CIRCLE 454 ON READER SERVICE CARD

Insight Window Designer and p-System are trademarks of SofTech Microsystems, Inc.
UCSD Pascal is a registered trademark of The Regents of the University of California.
IBM is a registered trademark of International Business Machines.
Apple is a trademark of Apple Computer, Inc.
Rainbow is a trademark of Digital Equipment Corp.

TO GET AHEAD IN BUSINESS,





INTRODUCING AURA. THE MOST ADAPTABLE SOFTWARE YOU CAN BUY.

To become successful, you have to work in your own special way. Unfortunately, most software works in ways that aren't the same as yours. And that can make your climb to success much tougher.

But Aura is the software that works the way you do. In fact, Aura adapts easily to your type of business. And to your individual way of doing business.

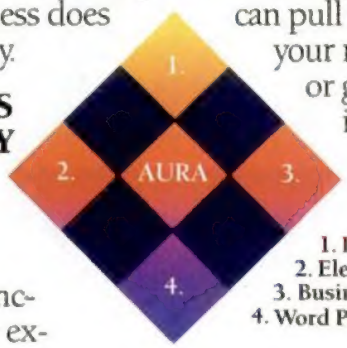
This flexibility results from the special capabilities of a database that integrates with 3-D spreadsheets, business and free-form graphics, plus word processing. And Aura's totally menu-driven design makes it all easy to use.

APPLICATIONS THAT APPLY TO YOU.

With Aura, you can create your own menus and define entire sets of tasks. This unique capability means you can make Aura operate exactly the way your business does at the touch of a key.

IT INTEGRATES WITH THE WAY YOU WORK.

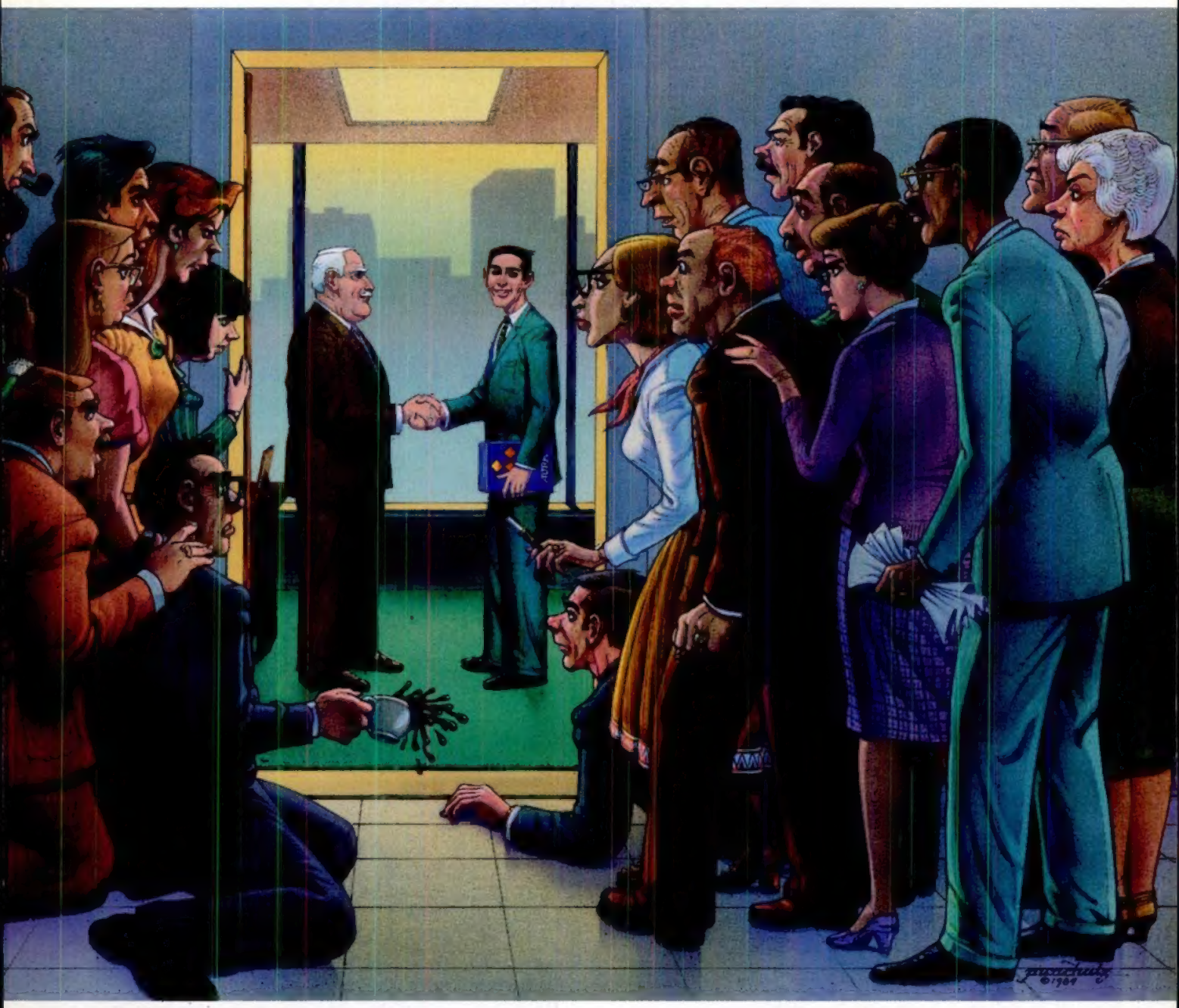
Aura's integration lets you instantly tie one function to another. For example, while you're using the word processor, you can pull information from your records, spreadsheets or graphics to include in the report you're working on. You'll



1. Information Management
2. Electronic Spreadsheets
3. Business Graphics
4. Word Processing

Copyrighted material

YOU NEED THE AURA OF SUCCESS.



never enter information twice.

AURA WON'T GROW OLD.

Aura keeps adapting and growing with you, too. When you change file data in the Information Manager, Aura's other functions are automatically updated so you're always working with current data. And if you change the structure of a file, all the records in that file change as well.

AURA ADAPTS TO YOU.

Simply put, Aura is the software that can mirror the way you do business. Not just approximate it. So if you want to get the most out of an IBM or similar personal computer, get the software that will fit you personally. You'll work faster and easier than ever before. And that can give you the Aura of success.

To find out more ask your local computer dealer, or contact: Softrend, Inc., 2 Manor Parkway, Salem, NH 03079, (603) 898-1896.

AURA™

The most adaptable software you can buy.

CIRCLE 534 ON READER SERVICE CARD

Copyrighted material

Win an EAGLE PC Plus II from Micro Mart™

Prize includes 13" RGB Color Monitor, 128K RAM, Two Floppy Disk Drives, SuperCalc³, MS-DOS 2.0 and CP/M-86.



That's right! You can win a new **EAGLE PC Plus II** micro system from Micro Mart. **FREE!** One lucky winner will be drawn at random on Sept. 29, 1984. All entries must be postmarked by Sept. 23, 1984. No purchase is necessary, but offer is void where prohibited by law. Anyone professionally associated with Micro Mart is ineligible.

Micro Mart is a registered trademark of Micro Mart, Inc.
Eagle is a registered trademark of Eagle Computer, Inc.

AMERICA'S PC SPECIALIST

MICRO MART™

See Our Ads•P.40 & Back Pages

☐ **YES!** I want to enter Micro Mart's "FREE EAGLE" Contest.

☐ **YES!** Keep Me Posted on Product Pricing and Availability.

Mail today to: "FREE EAGLE", 3159 Campus Drive, Norcross, GA 30071

Name _____

Company (if any) _____

Street Address _____

City/St/Zip _____

Tel: Day (___) _____ Evening (___) _____

Official 'Free EAGLE' Entry Form

PC
The Independent Guide to IBM Personal Computers

PUBLISHER ..... Jeff Weiner

EDITOR ..... Bill Machrone
EXECUTIVE EDITORS ..... Mike Edelhart, Connie Winkler
MANAGER, COPY EDIT ..... Anne Freed
MANAGING EDITOR ..... Barry Owen
SPECIAL PROJECTS EDITOR ..... Paul Somerson

ASSISTANT MANAGING EDITOR ..... Susan Hurley
SENIOR COPY EDITOR ..... Jennifer de Jong
ASSOCIATE EDITORS ..... Barbara Krasnoff, Stephanie Stallings
TECHNICAL ASSISTANT ..... Michael O'Cone
PRODUCTION EDITOR ..... Paul Ross
ASSISTANT EDITORS ..... Jean Atelsek, Karen Cook, Lisa Kleinman, James Langdell, Janet Lewis, David Obregón, Fredric Paul
EDITORIAL ASSISTANTS ..... David Baker, Cheryl Goldberg, Nina Kirschner, Jane Mintzer, Roz Tobias
OFFICE MANAGER ..... Iris Knittel
CONTRIBUTING EDITORS ..... Frank J. Derfler, Jr., Will Fastie, Stephen Manes, Peter Norton, Martin Porter, Winn L. Rosch, Corey Sandler, Jared Taylor, Lindsy Van Gelder

EXECUTIVE ART DIRECTOR ..... Mitch Shostak
ART DIRECTORS ..... Mary Zisk, Gerard Kunkel
ART EDITOR ..... Mariano Nicieza
ASSISTANT ART DIRECTOR ..... Rosalyn Migdal, Louise White
MECHANICAL ARTISTS ..... Annette Fournet, Anita Genco,
PRODUCTION ARTISTS ..... Eddie Baumgarten, Susan Ahlman

SUBSCRIPTION DIRECTOR ..... Chet Klimuszko
TELEMARKETING MANAGER ..... Linda Rossiter
NEW BUSINESS MANAGER ..... Eric A. Bernhard
RENEWAL AND BILLING MANAGER ..... Shane Boel
DIRECT RETAIL SALES ..... Gerald Grossman

ADVERTISING COORDINATORS ..... Helen Forgenie, Scott E. Pearl
DISTRICT MANAGERS
NORTHERN CALIFORNIA and NORTHWEST ..... David Riegler (415) 594-2290
SOUTHERN CALIFORNIA ..... Barbara Farkas (213) 387-2100
NEW ENGLAND and NEW YORK ..... Ellen Atkinson (212) 725-7947
MIDWEST ..... John Hemsath (312) 346-2600
MIDATLANTIC and SOUTHEAST ..... Bob Ostrow (212) 725-7947
ACCOUNT SALES MANAGER ..... Pauline Scherer
ACCOUNT REPRESENTATIVES ..... Jane Anderson, Lisa Kampfman, Kathy Krochta, Tom Leibacher, Anne Robbins, Jan Schultz, Patty Schwartz, Pam Sigal.
ASSISTANT to the PUBLISHER ..... Mary Alice De Paola

ADVERTISING OFFICE ..... Ziff-Davis Publishing Company,
One Park Avenue,
New York, NY 10016 (212) 725-7947

FOUNDER ..... Anthony Gold

CONSUMER COMPUTERS & ELECTRONICS MAGAZINE DIVISION

PRESIDENT ..... Larry Sporn
VICE PRESIDENT MARKETING ..... J. Scott Briggs
VICE PRESIDENT CIRCULATION ..... Carole Mandel
VICE PRESIDENT GENERAL MANAGER ..... Eileen G. Markowitz
VICE PRESIDENT LICENSING AND SPECIAL PROJECTS ..... Jerry Schneider
VICE PRESIDENT, CREATIVE SERVICES ..... Herbert Stern
CREATIVE DIRECTOR ..... Peter J. Blank
DESIGN DIRECTOR ..... Brian Day
EDITORIAL DIRECTOR ..... Jonathan D. Lazarus
MARKETING MANAGER ..... Ronni Sonnenberg

ZIFF-DAVIS PUBLISHING

President Richard P. Friese; **President, Consumer Magazine Division** Albert S. Traina; **Executive Vice President, Marketing and Circulation** Paul H. Chook; **Senior Vice President** Phillip T. Heffernan; **Senior Vice President** Sidney Holtz; **Senior Vice President** Edward D. Muhlfeld; **Senior Vice President** Philip Sine; **Vice President** Baird Davis; **Vice President** George Morrissey; **Vice President** Rory Parisi; **Vice President** William L. Phillips; **Treasurer** Selwyn Taubman; **Secretary** Bertram A. Abrams

PC: The Independent Guide to IBM Personal Computers ISSN (#0745-2500) is published bi-weekly for $34.97 for one year (26 issues), $61.97 for two years, and $81.97 for three years. Additional postage $44.00 for Canada and all other foreign countries. PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. POSTMASTER: Address changes to *PC, The Independent Guide to IBM Personal Computers*, P.O. Box 2445, Boulder, CO 80322. **Editorial and Business Office:** One Park Ave., New York, NY 10016. Editorial (212) 725-4694, Advertising (212) 725-7947. For subscription inquiries and service, write to PC Magazine, P.O. Box 2445, Boulder, CO 80322. *PC* is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp.

Entire contents Copyright © 1984 PC Communications Corp. All rights reserved; reproduction in whole or in part without permission is prohibited. The following are trademarks of PC Communications Corp.: PC, PC: The Independent Guide to IBM Personal Computers, PC Mart, PC-Lab, PC-Communiques, Project PC, PC Tutor, PC: BlueBook, User-to-User, PC News. **Permissions:** Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jean Lamendorf, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. **Editorial Communications** may be addressed to SOURCE BBB343, CompuServe 71226,713, or MCI Mail 157-9301

BPA

Copyrighted material

The new HERCULES™ Color Card gives you the parallel port IBM® forgot–for $1 more.



And it fits into the XT's short slot.

The new Hercules Color Card gives you these five important features.

1. A parallel printer port. If you buy IBM's color card, you won't get a parallel port for a printer. Ugh. You've just wasted a valuable slot for an extra printer card.

2. It's short. Our new Color Card uses advanced gate array technology to reduce the chip count by 30 and use less than half the board space IBM does. Which makes the new Hercules Color Card perfect for the short slot in an XT.

3. Fully IBM compatible. Any program that runs on IBM's color card will run on the new Hercules Color Card. With RGB or composite video, any IBM compatible monitor will work too.

4. Hercules Graphics Card compatible. If you have a Hercules Graphics Card (model GB101 or later), or plan to buy one, an ingenious software switch on our new Color Card allows both cards to be kept in the system at the same time.

5. Low price. At a suggested list price of $245, the new Hercules Color Card has all these features for only $1 more than IBM's color card.



Call for our free information kit. See why the company that made the first graphics card for the IBM PC still makes the best.

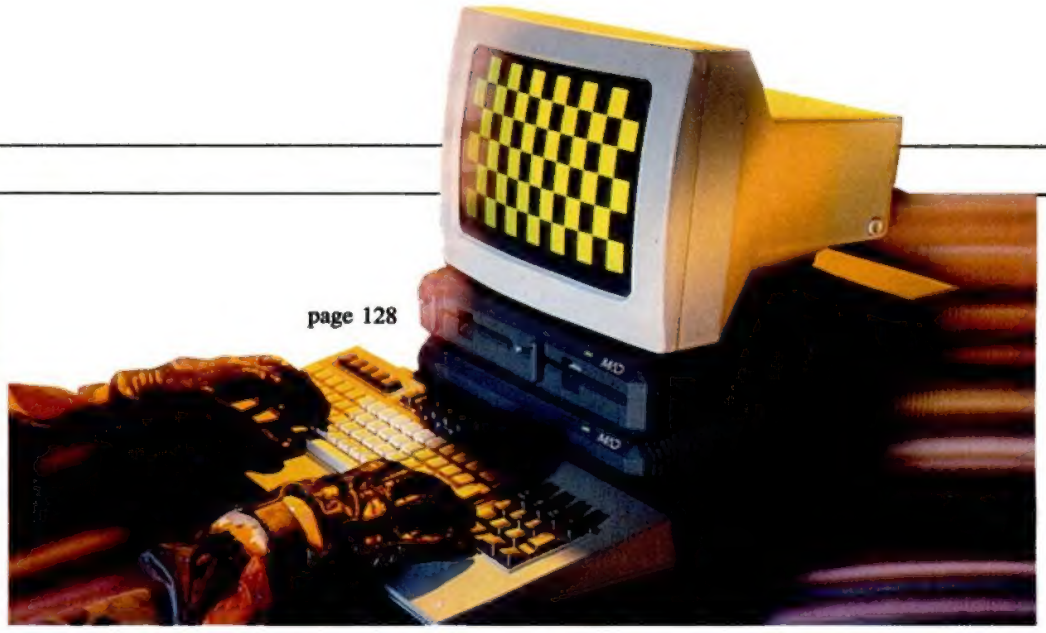
Hercules. We're strong on graphics.
800 255 5550 Ext. 420

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** 2 year warranty **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; SourceWare/Australia. Trademarks/Owners: Hercules/Hercules Computer Technology; IBM/International Business Machines.
Suggested List Price as of 2.22.84 for the IBM Color Graphics Adapter.

Copyrighted material

The Independent Guide to IBM Personal Computers

VOLUME 3, NUMBER 14
JULY 24, 1984



page 128

COVER STORY



Getting the Picture with CAD . . . 111
Allen E. Meilach/A look at four computer-aided design packages that let you use a PC to create, edit, and make hard copies of drawings. Best of all, these micro-based systems give you 80 percent of a larger system's performance at much less than 80 percent of the cost. As little as $1,000 will buy you a wide range of CAD capabilities, from drawing, pan, and zoom commands to more sophisticated sketching and animation features.

FEATURES

HARDWARE

A Sporty Compatible 128
Alfred Poor/The glossy, beautifully designed MAD-1 boasts performance that is as speedy and sleek as its looks. And best of all, MAD-1 is quite compatible.

The First Integrated Printer 148
Winn L. Rosch/The VectorPrinter 430 offers letter- and draft-quality text printing, color graphics, and plotting capabilities.

SOFTWARE

Jack2 Sprints to the Fore 139
Edward Baras/Though it's not for number crunchers, *Jack2*, from Business Solutions, Inc., fills an important gap in the integrated software market.

A Scope for Your Micro 243
Frank J. Derfler, Jr./Here's the scoop on *Infoscope*, a database program with windows.

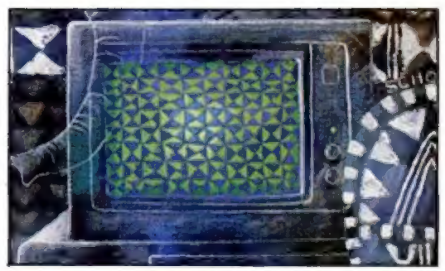
APPLICATIONS

Stitching Creative Designs by Pixel 161
A. Scott Earle and Catherine Vlastou/Here's how you can translate computer graphics designs from the computer screen onto a needlepoint canvas.

A Casino Puts Its Chips on the PC 232
Martin Porter/Resorts International in Atlantic City is betting on the PC to help it manage its casino operation.



On the Road to Africa 238
John Case/An American relocating to Africa ships his PC to Botswana and starts a pioneering user group.



SPECIAL REPORT

Project: Database, Part 4 169
We continue our in-depth investigation of the DBMS packages available for your PC. This issue examines Category 2 databases, which are relational, can work with at least two files at a time, and include a query language.

TELECOMMUNICATIONS

An Automatic Approach to Networks 216
Barbara Krasnoff/You can teach *PFS:ACCESS* to streamline the process of signing on to electronic networks.

BOOK EXCERPT

Tailoring DOS to Fit 221
Van Wolverton/You can customize DOS to meet your needs with special filing systems and batch commands for file access, backup, and record management.

LANGUAGES

COBOL with a Personal Touch . 251
Eric Bank/Personal COBOL offers an integrated COBOL package for the COBOL programmer who prefers to work on a PC. It includes a full-screen editor, syntax checker, and a forms-painting facility.

Copyrighted material



page 232



page 148

PRO COLUMNS

LAW

For Crowded Courts: PC Spells Relief 114

Eric Freedman/A judicial district is using PCs to help ease its crushing load of paperwork, without hiring additional support staff.

BUSINESS

Balancing Act 277

Hannah I. Blank/With earnings on account balances subject to changes in interest rates, bank profitability can be enhanced using a PC and a spreadsheet to keep minimum balance requirements properly adjusted.

ENGINEERING

An Eclectic Program Collection . 287

Nicholas Basta/A new "electronic book," a paperback published by Prentice Hall and equipped with a disk inside, offers mathematical, engineering, and graphics programs.

MEDICINE

Beyond Essentials 291

Bernard Friedman, M.D./A wish list of medical management system bells and whistles—some available, some coming soon.

PROGRAMMING

Enhancing PC-DOS 339

Gregg Weissman/You can create custom abbreviations in the DOS environment by modifying the COMMAND.COM program.

TELECOMMUNICATIONS

Looking It Up on Knowledge Index 369

Alfred Glossbrenner/The Knowledge Index gives easy access to articles from hundreds of computer publications at an affordable price.

DEPARTMENTS

WHAT'S INSIDE 15

PC NEWS 33

Twelve pages of up-to-the-minute reports, interviews, mini-reviews, and useful tips, along with entertaining tales and fables from the computer community.

FROM THE EDITOR'S SCREEN

Year of the Onion 81

Bill Machrone/No, 1984 isn't the year of the window or the mouse. When we weren't looking, the onion became the symbol of the year.

GUEST EDITORIAL

It's Time for a Change in MIS . . . 89

Irene S. Nesbit/MIS departments need to keep up with changing times and expanding technology.

LETTERS TO PC 91

THE NORTON CHRONICLES

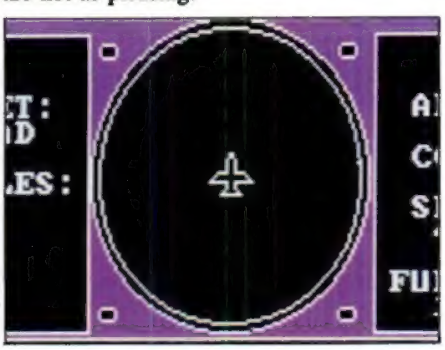
When DOS Is Not Enough 103

Peter Norton/Truly generic DOS is a rare beast indeed.

PC ARCADE

A Brush with Fun 261

Corey Sandler/ROLLO paints a pretty picture, but two new Avalon Hill offerings are not as pleasing.



BOOK REVIEW

The Reference Shelf: Where to Turn 267

Luther Sperberg/Computer reference books you can count on for information about IBM software, the microcomputer marketplace, and the best microcomputer books.

NEW ON THE MARKET 299

David Obregón/The latest in hardware, software, accessories, publications, and services for your PC, as well as company addresses and telephone numbers, prices, and technical requirements.

PC BLUEBOOK 314

A quick reference guide for PC owners and soon-to-be owners.

PC:MART 327

CLUB NEWS 335

Susan Hurley/Listings of dozens of IBM PC user groups.

PRODUCT INDEX 351

USER-TO-USER 356

Paul Somerson/PC owners share their tips and short programs.

PC TUTOR 365

Mark Zachmann/PC gives answers to readers' questions about personal computing, both technical and nontechnical.

INDEX TO ADVERTISERS 378

COMING UP

PCjr. 373

PC Tech Journal 374

PC Disk 375

PC Magazine 381

Cover Photograph: Dennis Chalkin

Copyrighted material

VCN EXECUVISION™

The Presentation Graphics Program™ from Prentice-Hall, Inc.



How you present your message is just as important as *what you present* in today's competitive environment. That's why so many executives, managers, salespeople, and professionals in every field, from doctors to attorneys...teachers to architects are relying more and more on visual presentations to convey their complex ideas and information.

Now there is an incredibly advanced software program that will allow you to create professional quality graphic presentations right on your IBM PC or IBM XT. VCN ExecuVision, from the Business and Professional Division of Prentice-Hall, brings the power of a complete graphic arts department to your computer. *In minutes*, you can create exciting presentations that previously would have taken days, or weeks, for an art department to complete. Presentations that you can run directly on your computer monitor or with an overhead projection screen...or convert to hard copy or slides.

VCN ExecuVision is the ideal tool for meetings, new business proposals, consulting symposia, educational/training programs, marketing plans, management reports, or virtually any other professional presentation.

Automatically plotted charts and graphs are just the beginning. You'll have access to hundreds of *pre-drawn* images and clip art from special add-on graphics libraries created specifically to add visual impact.

- Graphically frame your most important ideas and information with artwork from the *The Border Collection.*
- Use *The Initials & Decorative Design Collection* to emphasize key words or phrases in your text.
- From production lines to executive suites...there's an ideal visual to enhance your report or proposal data in *The Industry & Business Collection.*
- Add the human touch to presentations by including representations of people from *Professions: The Faces and Figures Collection.*
- Images from all over the world are at your fingertips in the *International Symbols & Landmarks Collection.*
- Give your data geographic perspective and impact with images from *The Maps and Regions Collection.*

Each library contains both full screen images and partial screens (pixes). You can use the entire image, or, with the electronic CUT AND PASTE program function, use just a detail from the full screen. You can modify or enhance the images, mix and match them, choose from 64 possible color combinations... you can even set the images in motion across the screen using VCN ExecuVision's animation functions.

With the program's sketching capabilities, you can create your own visual images! For your text, choose from 10 different type styles, from bold to italic, plain to fancy.

Best of all, you don't have to be an artist to use VCN ExecuVision successfully. Every function is offered in a series of easy to follow menus. VCN ExecuVision also comes with a tutorial disk and an extremely easy-to-follow full-color manual that will take you step by step through the program.

VCN ExecuVision can immediately be put to use making all of your information and ideas—*and you!*—look sharper, more prepared, and more professional.

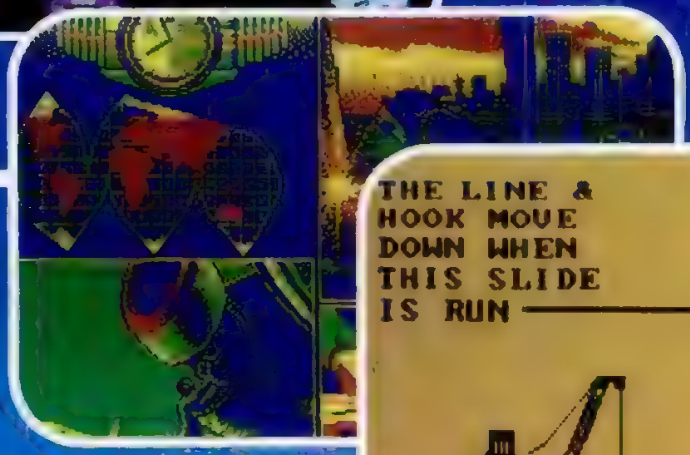
For a demonstration of VCN ExecuVision, visit your nearest computer software dealer. For more information, call toll-free 800-624-0023 (NJ residents call 800-624-0024), or return the coupon on the facing page.

Copyrighted material

MS DOS 2.0/2.1 VERSION NOW AVAILABLE

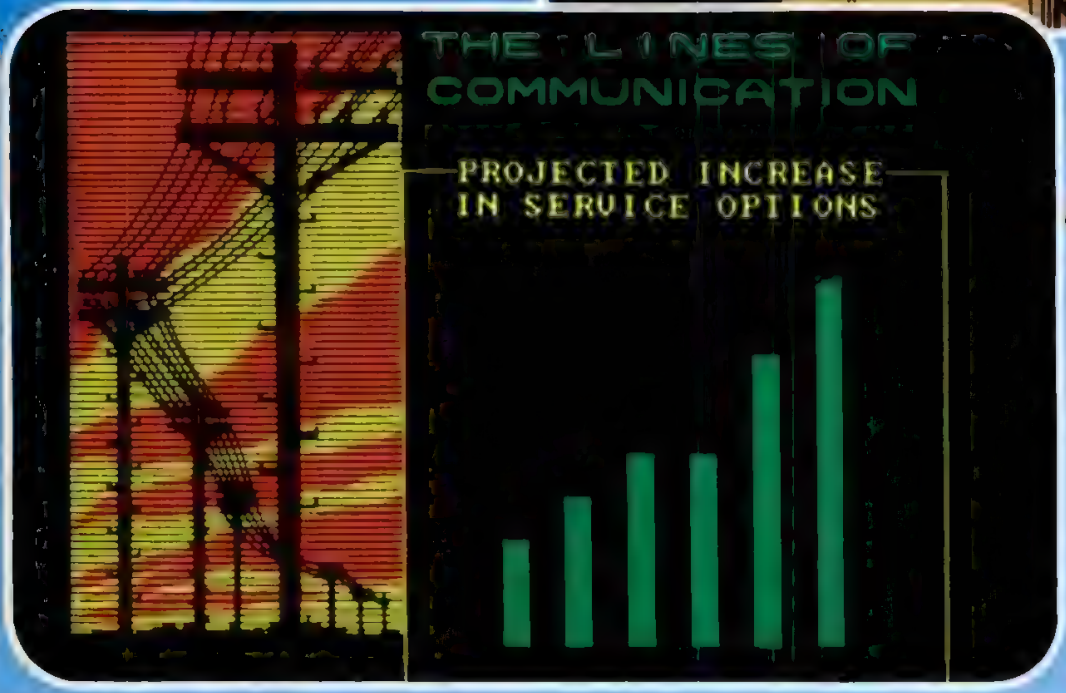


"...Prentice-Hall's VCN ExecuVision will become the standard against which other programs will be gauged."
—PC Magazine





ABOVE: just two of the library slides from which you can pick images to enhance your presentation data.





Designed for IBM PC and IBM XT

"You don't have to be an artist to create presentation slides like these in minutes!"

Suggested retail price $395. Graphics Libraries individually priced $80-$90.

Mail to:
VCN ExecuVision
Prentice-Hall, Inc.
200 Old Tappan Road,
Old Tappan, N.J. 07675

PC-7/24/84-CII

I would like to have more information on the exciting potential of VCN ExecuVision sent to the name and address below.

Name _____

Address _____

City _____

State _____

Zip _____

VCN ExecuVision is a trademark of Visual Communications Network, Inc., Cambridge, MA.
IBM is the registered trademark of International Business Machine Corporation. © 1984 Prentice-Hall, Inc.
Canadian inquiries: write to Prentice-Hall Canada, Inc., 1870 Birchmount Road, Scarborough, Ontario M1P2J7

CIRCLE 309 ON READER SERVICE CARD

How Can You Avoid Getting Trapped Under An Ancient Word Processor?



Buy Word Perfect!

Once upon a time, word processors were monstrous things. Dot commands, page orientation, and separate editing, formatting and printing programs turned them into lumbering beasts. Only a well-educated programmer would dare don his armor and tackle such a beast — not a pleasant task for a modern secretary, executive, or writer.

Then came WordPerfect and the beast was slain.

WordPerfect was designed to work for you not against you. WordPerfect has no command language to complicate your writing. Pressing a single key is all it takes to

bold, underline or center.

When writing, you don't want to worry about page formating, making room for headers or footers, or whether you are in "edit" or "create" mode. Your word processor should do it automatically and WordPerfect does. WordPerfect lets you think in terms of ideas, not pages. It is simple enough that you quickly forget about the mechanics and your writing flows easily.

So if you don't want to be caught under a word processing monster, try WordPerfect. We're certain it will improve the quality of your writing.

WordPerfect

You'll love it — not only for the features we've built in, but also for the antiquities we've left out.



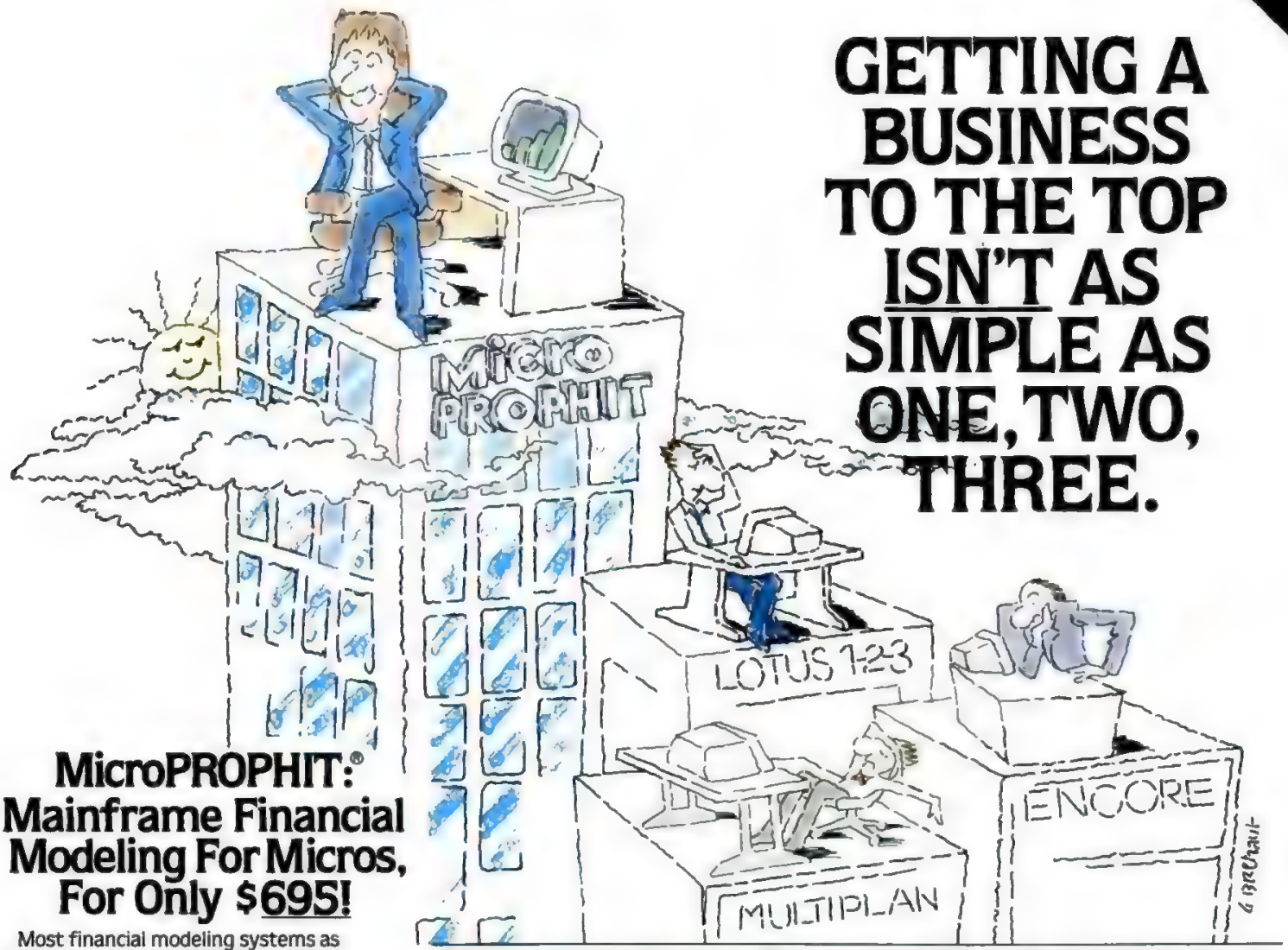
SATELLITE SOFTWARE INTERNATIONAL

288 WEST CENTER STREET, OREM, UTAH 84057 (801) 224-4000 TELEX 820-618

SSI

CIRCLE 149 ON READER SERVICE CARD

GETTING A BUSINESS TO THE TOP ISN'T AS SIMPLE AS ONE, TWO, THREE.



MicroPROPHIT:® Mainframe Financial Modeling For Micros, For Only $695!

Most financial modeling systems as inexpensive as MicroPROPHIT are little more than toys by comparison. That's a strong statement, but we're talking *very* powerful software. MicroPROPHIT goes much further than abbreviated spreadsheets or color graphics; it allows planners to develop decision support systems that accurately reflect their business environments, however complex they may be.

During the past 12 years, the leading name in financial planning software for mainframe computer timesharing has been PROPHIT.® That system has been used by thousands of companies to address complex needs. Now the same planning power is packed into a user-friendly IBM PC and XT-compatible package for corporate planners in large or small businesses.

COMPLETE MODELING. MicroPROPHIT allows construction of 135 column, 9,000 line models—*many times* the capacity of other systems. Over 70 mathematical and financial functions include: ☐ Depreciation ☐ Loan Amortization ☐ Net Present Value ☐ Simultaneous Equations ☐ Optimizing ☐ Table Lookup & Interpolation ☐ Currency Conversion ☐ Internal Rate of Return. *Thirty different projection methods* include: ☐ Linear, Stepped, or Compound Growth ☐ Straight Line, Quadratic, or Parabolic Projection from History ☐ Average of History ☐ Percent of Previous Line. COMPLETE CONSOLIDATING. Individual plan reports can be combined and consolidated for *a wide range of requirements:* ☐ Column-by-Column Consolidation ☐ Consolidation of Dissimilar Reports ☐ Post-Consolidation Recalculation of Model Logic ☐ Scheduled Consolidation ☐ Referencing Data in Other Reports. COMPLETE ANALYSES. With its many automatic analysis functions, MicroPROPHIT lets you study *a broad range of alternatives:* ☐ Goal Seeking ☐ What-If (Six Functions) ☐ Plan Difference Display ☐ Line Item Ratios, Base Period Ratios, & Period to Period Changes ☐ Graphics. READY TO USE MODELS. At additional cost, a library of *industry- and function-specific applications* ready to solve business situations is available: ☐ Manufacturing Co. Planning ☐ Cash Forecasting ☐ Capital Investment Analysis ☐ Bank Planning ☐ Savings & Loan Planning ☐ Insurance Co. Planning ☐ and Others. CONSULTING SERVICES. Applications specialists are available to make modifications or *develop customized new systems* suited to individual needs. AFFORDABLE PRICING. All this planning power and sophistication comes at *the surprisingly modest price of $695.* And MicroPROPHIT comes with a risk-free 30 day money back guarantee! Why not start using the planning tool that can get *your* company to the top?

☐ YES! Please forward ___ MicroPROPHIT systems (w/manual) at $695 each
☐ Payment Enclosed
☐ C.O.D.
☐ Yes, I'm interested. Please forward ___ MicroPROPHIT manuals @ $35 each.
☐ Send additional information

CA residents add 6% sales tax

Name _____ Title _____

Company _____ Computer Make/Model _____

Address _____

City _____ State _____ Zip _____ Phone _____

VIA COMPUTER INC.

7177 Construction Court • San Diego, CA • 92121 • 619/578-5356
TOLL FREE (800) 633-1883 • CA (800) 543-4463 Dealer Inquiries Invited

Lotus and 1-2-3 are trademarks of Lotus Development Co.
Encore is a trademark of Ferox Microsystems, Inc.
Multiplan is a trademark of Microsoft Corp.
MicroPROPHIT and PROPHIT are registered service marks of Via Computer Inc.

CIRCLE 132 ON READER SERVICE CARD

ARE YOU TIRED OF FLOPPY EXCUSES?

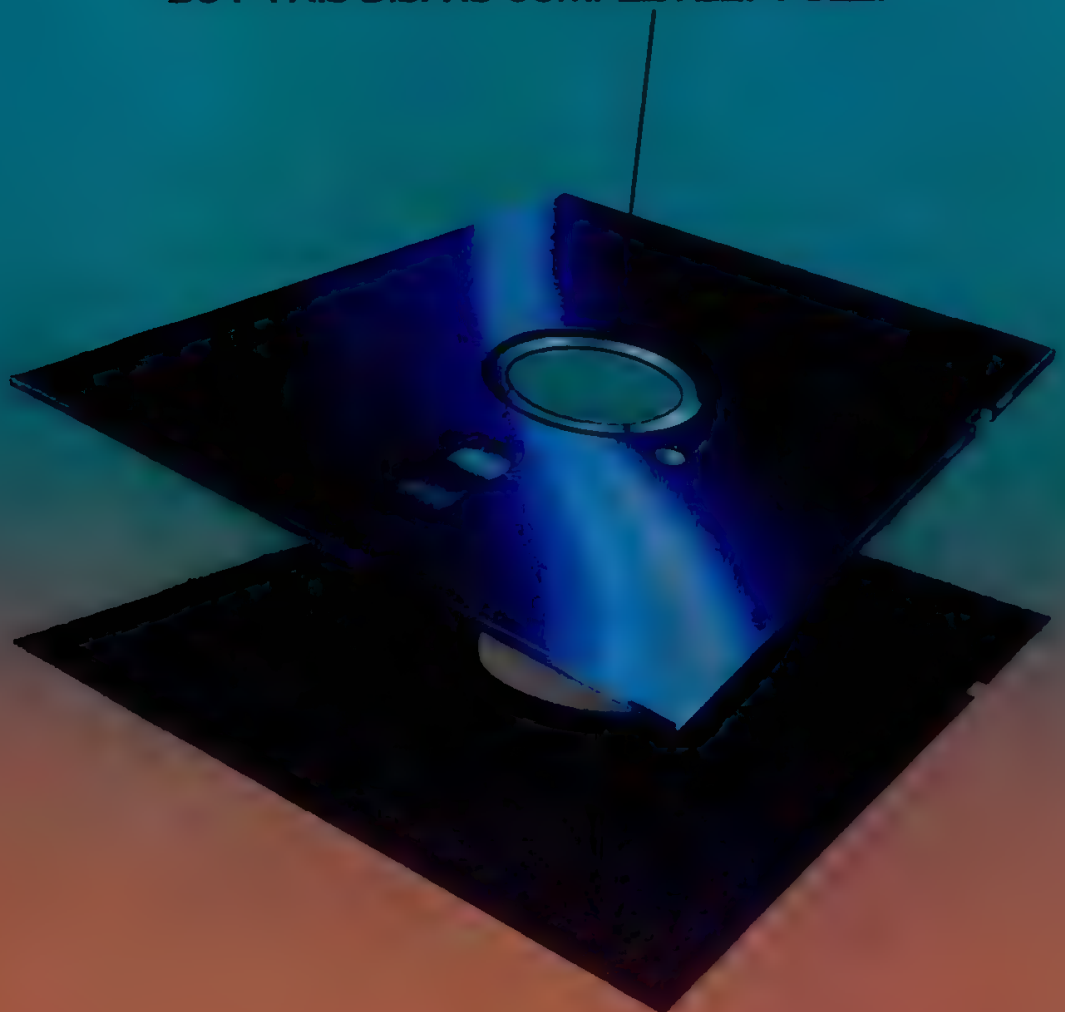
QuadDisk has all the answers
When you have QuadDisk, Quadram's new Winchester hard disk system, you can leave all the limitations of floppy disks behind. Because QuadDisk does a lot more for you. A lot faster. And in the same amount of space.

Maximum storage in minimum space
QuadDisk actually turns your IBM or compatible into a micropowerhouse. Without turning your computer into a main frame.



QuadDisk is designed to be fully integral. It installs quickly in the same space as your second 5¼" floppy drive. Once it's in, you'll hardly even know it's there.

"EXCUSE ME, I REALLY HATE TO BOTHER YOU AT A TIME LIKE THIS BUT THIS DISK IS COMPLETELY FULL."



A Choice of 5 to 65MB
QuadDisk comes in megabyte capacities, for all the on-line storage space you need. If you're interested in added data security and flexibility, there's QuadDisk with removable cartridges for up to 5MB of off-line storage.

It's menu-driven so you can copy, erase, rename, run and manipulate files and



QuadDisk comes complete with powerful menu-driven software. You can maintain files and check disk status easily.

programs at the touch of a key. Without any complicated DOS commands.

A fast worker
You can count on QuadDisk to make fast work of any task. Features like direct memory access, sector interleaving and cache buffering let you get the job done quicker than ever before. And with multi-tasking, QuadDisk lets your computer perform up to 9 different tasks at once.

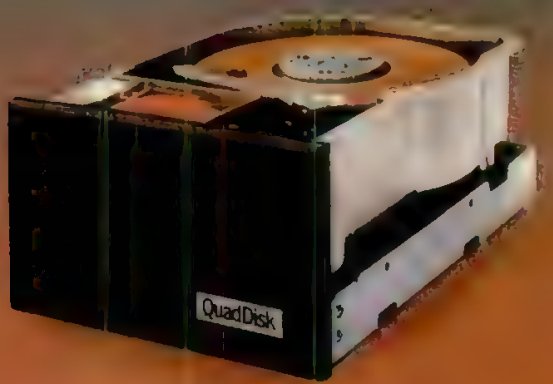
For added safety, QuadDisk contains an error correct code that will automatically correct any bad information on the disk surface during the read/write function.

Quadram Quality
Last, but not least, QuadDisk is backed by the Quadram Quality seal. The mark of dependability and performance from the leader in microcomputer enhancements.

Visit your local dealer today and ask to see QuadDisk in action. When you watch it perform, you won't flip flop on the issue of hard disks any longer. You'll choose QuadDisk by Quadram.

QUADRAM QUALITY™

QuadDisk™ by Quadram.™



QUADRAM™
An Intelligent Systems Company

4355 International Blvd. Norcross, GA 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

IBM® is a registered trademark of International Business Machines Corporation.
COMPAQ® is a registered trademark of COMPAQ Computer Corporation.
EAGLE® is a registered trademark of Eagle Computers, Inc.
©Copyright 1984 Quadram Corporation.
All rights reserved.

CIRCLE 337 ON READER SERVICE CARD

The only Real Alternative for Tape Backup... Davong

If you have an IBM® XT or have added a hard disk to your IBM PC, Davong can give you a happier future. Just plug in Davong tape backup.

Davong tape backup can prevent that sinking feeling that comes from losing data. One disk malfunction or programming error could wipe out a week's work, but not if you have Davong backup.

The Davong streaming tape drive backs up any Winchester disk drive used with IBM PC or XT microcomputers. Each tape cartridge gives you up to 18 megabytes (formatted) of safe, secure storage.

Davong makes it easy.

Utilities provide for initial checkout, copying from hard disk to tape, and restoring files from tape to hard disk. They also compare file dates so that the most current file with the same title is restored.

Protection plus. If you use a Davong hard disk system under the Davong Multi-OS™ control system, backup can be accomplished by volume or individual file. A 15 megabyte disk can be copied in about four minutes. Four error checking methods ensure data integrity.

You can have peace of mind for only $[illegible].* And it's available from more than 800 Davong dealers. Don't you deserve Davong backup.

Your IBM PC & XT deserve Davong.

DAVONG

217 Humboldt Court
Sunnyvale, California 94089
(408) 734-4900

® IBM is a registered trademark of IBM Corporation
™ Multi-OS is a trademark of Davong Systems, Inc.

*Suggested retail price for standalone backup tape drive with all cabling and adapters, software utilities, comprehensive documentation, and 180-day parts and labor warranty. Also available for Davong hard disk systems for only $[illegible]



COMDEX/LAS VEGAS BOOTH [illegible]

CIRCLE ON READER SERVICE CARD

The Independent Guide to IBM Personal Computers

What's Inside

To an editor, laryngitis means two things: first, the art of yelling at writers must be performed via electronic mail and, second, conducting an interview becomes an impossible task.

There are certain disadvantages to coming down with laryngitis when you are an editor. The typical reader of *PC Magazine* might not think so—in fact, I can hear you all murmuring in a sulky chorus, "What on earth is he (she?) talking about? Editors don't do any talking—especially editors for high-tech microcomputer magazines. All they have to do is call up the manuscripts on their terminals, use a few deft keystrokes to get the stories in shape, and then send them on to the copy editors. And if they've got any writing to do—such as What's Inside—well, how much verbalization does that require?"

Oh, ye of little knowledge!

For example, one of an editor's most important jobs (and one that is taught in every college journalism course) is to know How To Yell At Writers. This art can take several different forms. It can be done blatantly, as in the time-honored tradition of most old-movie editors ("Higgensbottom, get me that story, or I'll have your blue pencil!"). It can be done in a more low-key, California style ("Ms. Crepshot, when you were in second grade, were you absent the day they covered sentence structure?"). It can even be done as a pitiful, Little Orphan Annie plea ("Please, please, please get your column in on time, or the publisher will revoke my limousine privileges . . . ").



The neat thing about all three of these forms of yelling is that they are also useful when addressing other editors who have the dubious honor of writing a biweekly column. So that when this particular editor showed up with frozen vocal chords and no idea for What's Inside, a chorus of editorial voices was heard demanding, in a variety of the above styles, the immediate delivery of the column.

Finally, the poor editor croaked, "Don't worry. I'll just interview the writers about their various stories. It'll take an hour at most, and I'll have the column ready for you in no time at all." However, there turned out to be one catch to that otherwise brilliant idea.

When you have laryngitis, you can't interview people, either.

So the editor couldn't talk to Allen Meilach about his cover story on CAD—computer-aided design. Until recently, quality computer-generated designs could only be produced using systems that cost anywhere from $50,000 to $250,000, thus leaving small businesses and graphic artists out in the cold, clutching their colored pencils and wondering how to compete. However, with the advent of the 16-bit microcomputer, CAD has been brought into the economic range of almost anyone who can afford a PC, and a variety of new hardware and software products are available to help the new, computerized designer take full advantage of the improved technology.

Neither was the editor able to interview Scott Earle, M.D., who writes for *PC* about graphics and optic design. He has become obsessed with using various graphics software to create a program for the PC and uses it to design patterns for needlepoint. He and a needlepoint enthusiast, Catherine Vlastou, put their heads and several graphics programs together and came up with a way to transfer a design on a computer screen to a needlepoint canvas. And in the process they managed to invent a new acronym: CAN (computer-aided needlepoint).

(continued)

Photograph: Dennis Chalkin

Luckily, no interview was needed with Marty Porter, whose recent exploits were well known around the editorial office. Porter, who along with his other qualities is an enterprising gentleman, one day decided it might be nice to do a bit of gambling. So after some judicious research, he called our editorial offices and told us that Resorts International was using PCs to monitor its games and customers. Of course, to do a really good job for *PC Magazine*, he'd have to go down to Atlantic City and thoroughly investigate the system—and by the way, could we advance him about $1,000 in quarters? We decided to go along with him on the Atlantic City idea, but staunchly refused his offer to split the take.

It would have been extremely costly, if not totally impossible, to get a phone interview with John Case. Case came to us several months ago with a few queries and a rather unusual problem: how to adjust his *PC Magazine* subscription for his new home in Botswana, Africa. "Botswana?" we thought, bemused. How do you get a PC to Botswana? And what do you do with it once you've got it there? Plenty, according to Case, who proceeded to write a piece for this issue on the trials and tribulations of computerizing Africa.

It wasn't really necessary to call associate editor Barbara Krasnoff, who offers a review of *PFS:ACCESS*, a new communications software package that purports to take the work out of hooking into on-line databases, or the writers who contributed to this issue's installment of "Project: Database." Also in this issue, Winn Rosch does his usual fine job reviewing the new Envision VectorPrinter 430, and Alfred Poor looks into the latest new MS-DOS-compatible microcomputer, the MAD-1. And Microsoft, the company that gave us MS-DOS, now gives us the inside story of how to use its operating system to the fullest in an excerpt from its new book, *Running MS-DOS*.

Of course, some of our readers may have only limited sympathy for the editor, who, finding that there was no way to communicate with this issue's authors in time to write this column, had to resort to a simple rundown of the various interesting and informative articles in this magazine. They may suggest that, with such exciting material to write about, the editor should have had no problem whatsoever.

You know what? They're right. ■



Dealer Inquiries Circle 186 on Readers Service Card
End Users Circle 187 on Readers Service Card.

Even the fastest fingers slow down when they struggle with computer commands. And no matter what software you use, you still have to enter the same things over and over again.

That's why you need SmartKey II Plus,™ the software that lets you control your computer with a single keystroke.

Add SmartKey to WordStar and you can juggle margins and insert "boilerplate" paragraphs or sentences with just one key. Add it to Lotus 1-2-3 and you can concentrate on the numbers instead of the mechanics. You can even tap into Dow Jones with the press of a finger.

Don't type in the same thing twice. SmartKey can remember commands, words, paragraphs, even entire letters. With SmartKey, you can work faster and never worry about which keys to press.

It's easy to see why thousands of people all over the world are already using SmartKey to make their lives easier.

SmartKey II Plus features.
Assign more than 30,000 characters to a single key.
Define over 300 function keys on any computer.
An exclusive "SuperShift" lets keys have up to seven meanings.
Change any keyboard to the DVORAK or IBM Selectric layout.
Keys can be redefined while other software is running.
Key definitions can be saved to disk for later use.
SmartKey II Plus is invisible to other software.
SmartKey II Plus runs on the IBM PC and compatibles, the PCjr, and all other MS-DOS, CP/M, CP/M-86, and CP/M-Plus based personal computers.



Best of all, SmartKey II Plus is still only $89.95.

To see how SmartKey II Plus can speed up your work, pick up a copy at your computer dealer. It's the smartest move you will ever make. Software Research Technologies, Inc., 3757 Wilshire Boulevard, Suite 211, Los Angeles, California 90010. (213) 384-5430.

Corporate and OEM licenses available.

SMART KEY II Plus
A Stroke Of Genius.

CIRCLE 252 ON READER SERVICE CARD

How to speed up the ten slowest parts of your computer.



WANTED



SOMETHING TO RELIEVE THIS MESS!

If you've ever found yourself searching for a calculator, notepad or appointment book when you've got a computer right in front of you, then you know the absurd situation we're illustrating.

Sure, there are clumsy little programs you can boot up to accomplish one or the other of these tasks . . . but that's generally meant first stepping out of the software you're working with.

What's always been needed is one powerful piece of software, occupying only a few K, that would be tucked away in an unused part of RAM no matter what program you're running.

Whether you were running dBaseII, Lotus 1-2-3, WordStar or even Turbo Pascal© . . . it would always be ready for lightning-fast use. You could just hit a button and open a window for a notepad, another for a calculator. Hit the button, again, and your work would be saved to disk and you'd be right back in your original software!

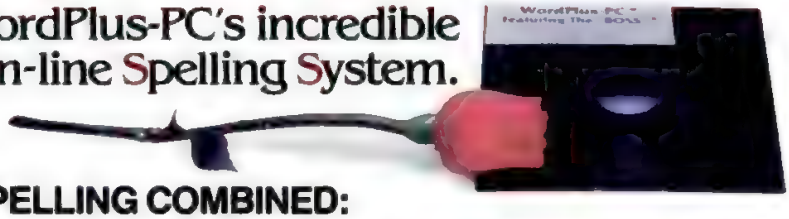
While we're at it, it should also have a perpetual calendar linked to a datebook. And even an autodialer, with a built-in phonebook.

Is this piece of software possible? At a price you can afford . . . now?

An Industry First in Word Processing Software:

WordPlus-PC™ featuring the BOSS™. Word processing so smart it can even spell 100,000* words.

Meet the BOSS. WordPlus-PC's incredible new Built-in On-line Spelling System.



WORD PROCESSING AND SPELLING COMBINED:

WordPlus-PC featuring the "BOSS" is a whole new technology in word processing software. Finally, the most powerful word processing capabilities have been combined with a built-in electronic spelling system which not only *checks your spelling* but also *corrects your spelling.*

The "BOSS", an acronym for Built-in On-line Spelling System, eliminates embarrassing spelling errors in your letters and stops time consuming trips to the dictionary.

But WordPlus-PC featuring The "BOSS" will do far more than just check and correct your spelling. It's been designed to be exceptionally easy to use and yet contain all the powerful features you expect and more. Like built-in mail merge for personalized form letters, invoice generation and the ability to merge information created by most other popular programs such as 1-2-3™ and dBASE II™. And if you have a question, just press the HELP key to get back on track.

You can also print bar graphs and other charts,** easily move columns, scroll horizontally, execute global search and replace, boilerplate text, and even print proportionally spaced on selected printers. And WordPlus-PC is compatible with virtually all popular letter-quality and dot matrix printers.

*With 90,000+ word standard dictionary and ability for a user to add over 10,000 "custom" words.

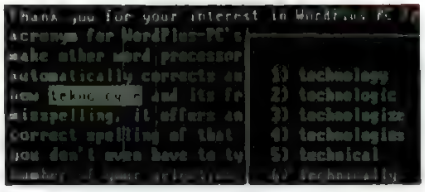
HERE'S HOW THE BOSS WORKS FOR YOU:

IT CHECKS



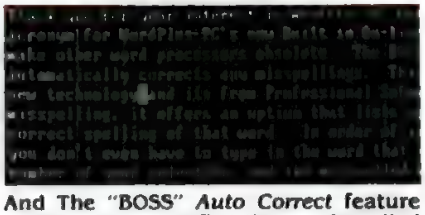
At the touch of a button, virtually anytime during typing or after the creation of a document, The "BOSS" locates and *highlights misspelled words* on your screen. The "BOSS" can even check the spelling of a word directly after it's been typed in.

IT SUGGESTS



When a word is misspelled, the user can ask The "BOSS" for suggestions as to how to correctly spell the word. With only one keystroke, The "BOSS" will display, in a dynamic on-screen window, up to eight *spelling suggestions in the order of probable phonetic correctness.*

IT CORRECTS



And The "BOSS" *Auto Correct* feature enables users to "fix" these misspelled words directly in text with a single keystroke. The "BOSS" is a total spelling system that Checks, Suggests, and Corrects your Spelling. All built-in.

THE TOTAL WORD PROCESSING SOLUTION — PLUS ALL THE HELP YOU'LL NEED.

With over 70,000 word processors in use worldwide, Professional Software, Inc. has designed WordPlus-PC to contain all the powerful features you expect — and to be the easiest word processor to use anywhere. But there will always be questions. That's why Professional Software has an entire bank of Nation-wide TOLL FREE customer HELP lines to support our registered users. This service is available at No Charge during the 90 days following the receipt of your registered users card.

Demand to see the BOSS in person
Visit your local professional computer dealer or call us toll free for the dealer nearest you. Once you witness the BOSS in action, you'll see that all other word processors have become totally obsolete.

Demand to see the "BOSS" today! Call us toll free, 1-800-343-4074.

Professional Software, Inc.

51 Fremont Street, Needham, MA 02194 Telephone (617) 444-5224 Telex 951579
Now Available for IBM-PC and Compatibles, DEC Rainbow, TI Professional, and Victor 9000.
Dealer, distributor, OEM manufacturer, and international inquiries are invited.

WordPlus-PC and The "BOSS" are trademarks of Professional Software, Inc.
1-2-3 is a trademark of Lotus Development Corp., dBASE II is a trademark of Ashton-Tate.
Specifications are subject to change without notice.

WordPlus-PC was designed and written by Andres Escallon.
**With IBM dot matrix and Diablo 630 ECS printer, bar graphs and other charts can be printed inside text.

CIRCLE 374 ON READER SERVICE CARD

WHAT WOULD YOUR CUSTOMERS SAY TO A MULTIFUNCTION MONOCHROME CARD?

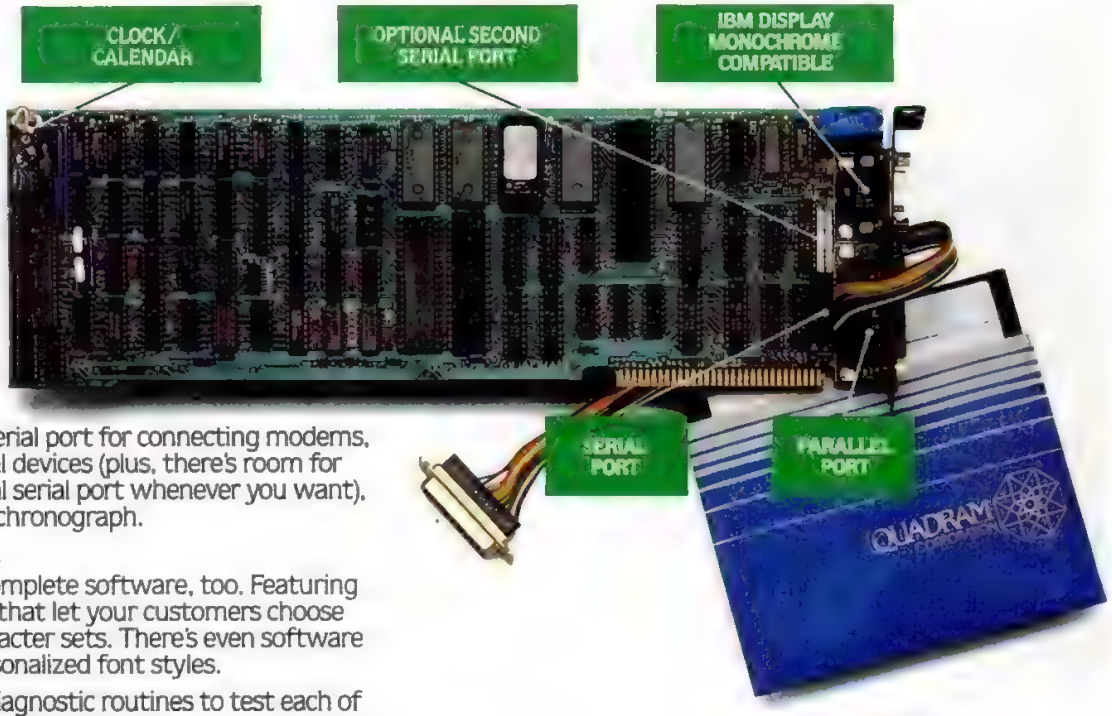


I'LL TAKE ONE PLEASE.



When your customers need a monochrome adapter card for the IBM PC/XT, make sure they get something special: Quadvue by Quadram. The monochrome adapter card packed with four additional hardware functions and special applications software, too.

Because Quadvue by Quadram is one monochrome card your customers will say yes to again and again.



A Monochrome Card...Plus
Snap Quadvue into the PC to drive any standard monochrome monitor. Then take advantage of Quadvue's extra features for expanded capabilities.

Quadvue comes with a parallel printer port, a serial port for connecting modems, plotters, and other serial devices (plus, there's room for adding a second optional serial port whenever you want), and a battery powered chronograph.

Complete Software, too
Quadvue comes with complete software, too. Featuring three special soft fonts that let your customers choose from a selection of character sets. There's even software to create your own personalized font styles.

Plus, there's complete diagnostic routines to test each of the Quadvue's functions. For trouble-free trouble-shooting.

Quadvue delivers
Quadvue gives your customers everything they're looking for in a monochrome card. Including a full one-year limited warranty, complete technical support, and the continuing tradition of Quadram Quality.™

QUADRAM QUALITY

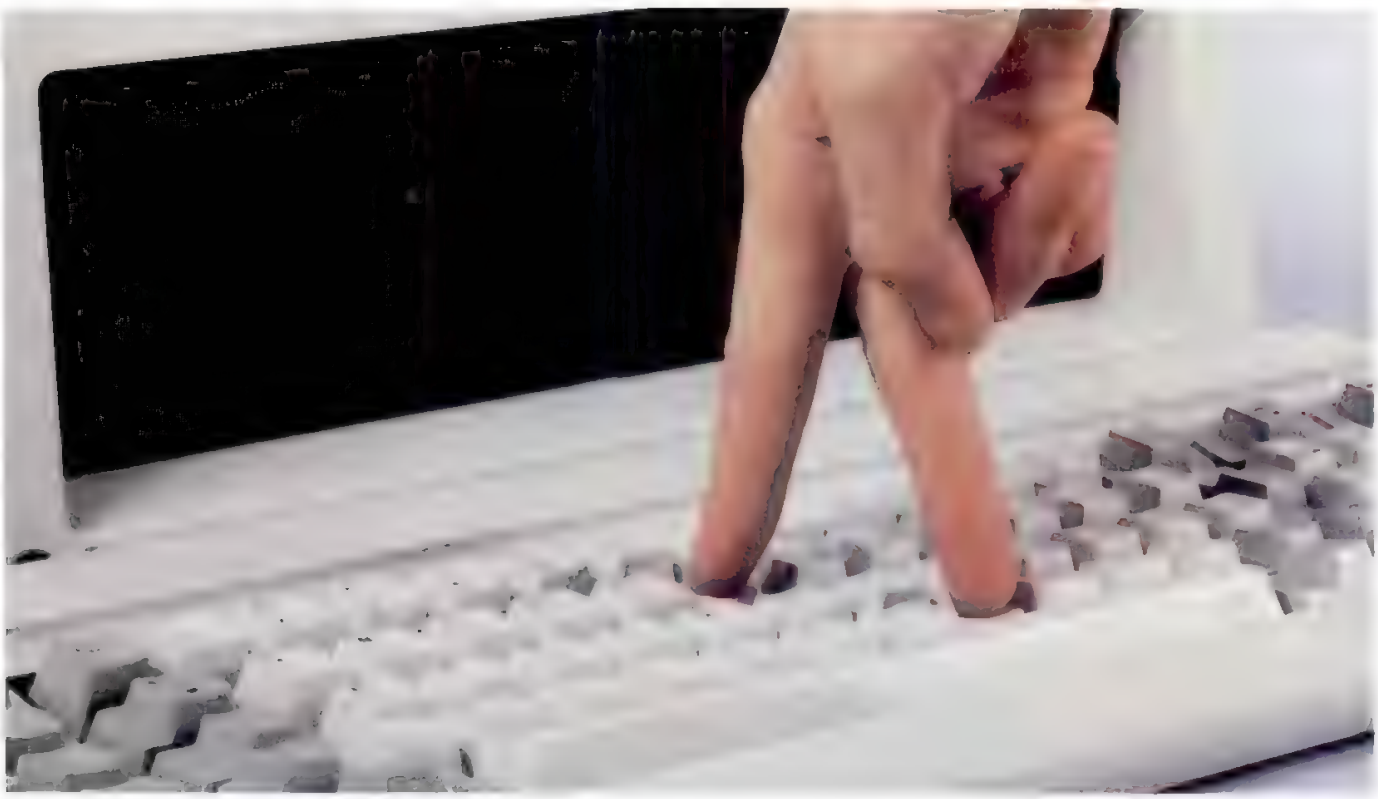
Picture it for yourself in your own store. Then watch how fast your customers make them disappear.

QUADRAM™
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

IBM® is a registered trademark of International Business Machines Corporation.
©Copyright 1984 Quadram Corporation. All rights reserved.

Let your fingers do the filing...



With DataPlus-PC™

Using DataPlus-PC, all your important last minute information is literally at the tips of your fingers. Incredibly fast and refreshingly easy to learn and use, DataPlus-PC transforms your personal computer into a powerful "electronic filing and report system" which allows you to perform a wide range of sophisticated database functions normally found in programs costing hundreds of dollars more.

Unlike other databases which require hours upon hours of "setup" time, DataPlus-PC has been carefully designed to allow even novice users to begin using it in a matter of minutes. DataPlus-PC incorporates the latest state of the art technology including a completely Menu Driven system which communicates with you in easy to understand English.



The unique **Super Scan™** function gives you the ability to search for and display any information record in seconds, providing you with almost instantaneous access to your important information. And DataPlus-PC's powerful **MLG™** (Mailing Label Generator) makes the designing and printing of time consuming mass mailings a breeze. In addition, DataPlus-PC's built-in **Report Generator** provides powerful mathematical capabilities and allows you to produce customized reports just the way you want them, when you want them. And with DataPlus-PC's integrated **Memo Window™** facility, you'll have a handy "extra text" area which allows you to include remarks, extra notes, client summaries, or other valuable information related to each record.

With DataPlus-PC's ability to easily interact with our best-selling WordPlus-PC™ word processing system, you can select specific information from DataPlus-PC and easily merge it into personalized letters, documents, overdue notices, etc. And DataPlus-PC's user friendly Tutorial Learning Guide assures that even first-time users will be using DataPlus-PC's powerful arsenal of features right from the start.

Don't settle for less than the best. Ask for DataPlus-PC at your local computer dealer or call us today for the dealer nearest you — and "let your fingers do the filing." DataPlus-PC is available from dealers nationwide, with a suggested retail price of $250.

DataPlus-PC, WordPlus-PC, Super Scan, MLG, and Memo Window are trademarks of Professional Software Inc
DataPlus-PC was written and designed by Tom Callen, Universal Software
Prices and specifications are subject to change without notice

Professional Software, Inc.

51 Fremont Street, Needham, MA 02194 Telephone (617) 444-5224 Telex 951579
Now Available for IBM-PC and Compatibles, DEC Rainbow, TI Professional
Dealer, Distributor, OEM Manufacturer and International inquiries are invited

CIRCLE 372 ON READER SERVICE CARD

The new IBM DisplayWrite



Little Tramp character licensed by Bubbles Inc., s.a.

*Prices apply at IBM Product Centers and may vary at other stores

**Available in July, 1984.

Series is here. Spread the word.

In 1980, IBM introduced the Displaywriter System. Today, it's become the best-selling stand-alone text processor in the world. One reason for this success is the Displaywriter's function-rich software.

If you're looking for software like that, but working on an IBM personal computer, you don't have to look any further. Because the IBM DisplayWrite Series is here.

And it will put many of the features and capabilities of a dedicated word processor to work for you when you're writing.

It runs in the family.

You'll find two word processing programs in this series: There's DisplayWrite 1, for IBM personal computers—including PC*jr.* And DisplayWrite 2, with added functions for your PC, PC/XT or *Portable* PC.

You'll also find DisplayWrite Legal, a dictionary of about 16,000 words that a lawyer might need to check.

And you'll find DisplayComm, which lets your IBM PC send and receive text to and from other IBM PCs. If you're writing at the office, this program could also let you send text to an IBM Displaywriter down the hall. (From there, it could be sent on to an IBM host computer for distribution.)

Some words on high function.

The DisplayWrite word processing programs give you the time-saving features you'd expect from IBM. Justified margins, centered lines and pagination, for example. You'll even have prompts and messages to help guide you along.

But there are also some features in DisplayWrite 2 you might not expect. Like easy column formatting, four-function math capability *plus* a spelling checker based on a dictionary of about 100,000 words.

Yet the biggest surprise of all may be the price.* DisplayWrite 1,** $95. DisplayWrite 2, $299. DisplayWrite Legal, $165. DisplayComm, $375.

Where you can find all four.

Get more information about the IBM DisplayWrite Series at your authorized IBM Personal Computer dealer or IBM Product Center. To find one near you, call 800-447-4700. In Alaska or Hawaii, 800-447-0890.

Stop there first and get the last word.



IBM®

Personal Computer Software

CIRCLE 136 ON READER SERVICE CARD

The New Generation In Word Processing...

is newer than ever!



OfficeWriter™

Office Solutions introduces more advanced features for the office environment. We've combined exceptional power and simplicity to bring you a word processor for the IBM PC and XT that makes sense.

It's the easiest to learn and most natural to use of all word processors available. OfficeWriter is patterned after dedicated systems such as Wang, Lanier, and the IBM Displaywriter. OfficeWriter is the type of high caliber word processing that business expects.

And we've just added 22 advanced features to make managing your paperwork even easier. Now you can do everything from right justification to data base interface.

Our on-line (on-screen) tutorial shows you how to put OfficeWriter to work immediately. There's no need to memorize complicated command sequences; all commonly used functions are labeled on our function key template.

OfficeWriter's careful human engineering lets you concentrate on writing instead of operating your word processor. Our dynamic screen formatting constantly adjusts your text, so what you see on the screen is what you'll get on paper.

If you do have a problem, our context sensitive "Help" screens provide information specific to the function you're using.

We're so certain that you'll be pleased with OfficeWriter that we'll give it to you for a 30-day trial. Make your office more productive for only $325, and we'll include our powerful mail merge capability

Our product support is just as good as our products. Our customers receive prompt telephone support and free updates for six months. So ask for OfficeWriter at your local computer dealer, or call us to see the difference a new generation can make.

Office Solutions

IBM is a trademark of International Business Machines Corp
Lanier is a trademark of Lanier Business Products Inc
WordStar is a trademark of MicroPro
Wang is a trademark of Wang Labs Inc

Office Solutions
5708 Odana Road
Madison, WI 53719 (608) 274-5047

CIRCLE 357 ON READER SERVICE CARD

In the Hard Disk Jungle, Tape Backup is a Way of Life.



In the hard disk jungle, floppy disk backup is a dangerous path to follow. Tape backup is the key to survival.

Imagine the catastrophic loss of data from your IBM®-XT or T.I. Professional fixed disk because of operator error or inopportune power failure. Without tape backup, you're on dangerous ground.

The Tallgrass TG-4160 gives you 60 Mbytes of cartridge tape backup and archival capacity, using the industry standard PC/T-11 personal computer tape format. Tape backup is fast and easy, even with elephant-sized files.

TALLGRASS INNOVATIVE FEATURES

- **60 MBYTES OF FORMATTED STORAGE** on an economical industry standard DC-600A tape cartridge.
- **PC/T-11 (Personal Computer Tape format)** allows complete file update and manipulation through TMS (tape management system).
- **AN INDIVIDUAL DIRECTORY** for each of the eleven tape tracks makes locating individual files easy.
- **MORE THAN JUST A TAPE BACKUP DEVICE,** the TG-4160 is a complete archival library system with easy access to individual files.

In the hard disk jungle, tape backup has become a way of life.

Available from COMPUTERLAND,® Entré Computer Centers,® MicroAge® Computer Stores and other participating computer dealers.

World Headquarters: Tallgrass Technologies Corp. / 11100 W. 82nd St. Overland Park, KS 66214 / 913/492-6002 / Telex: 215-406 TBYT UR

European Distributor: CPS Computer Group, LTD Birmingham, England B276BH (021) 707-3866

Australian Headquarters: Tallgrass Technologies (Australia) / Five Dock Plaza, Suite 12/50 Great North Road / Five Dock / Sydney, N.S.W. 2046 / (02) 712-3010

Tallgrass Technologies Corporation

CIRCLE 36 ON READER SERVICE CARD

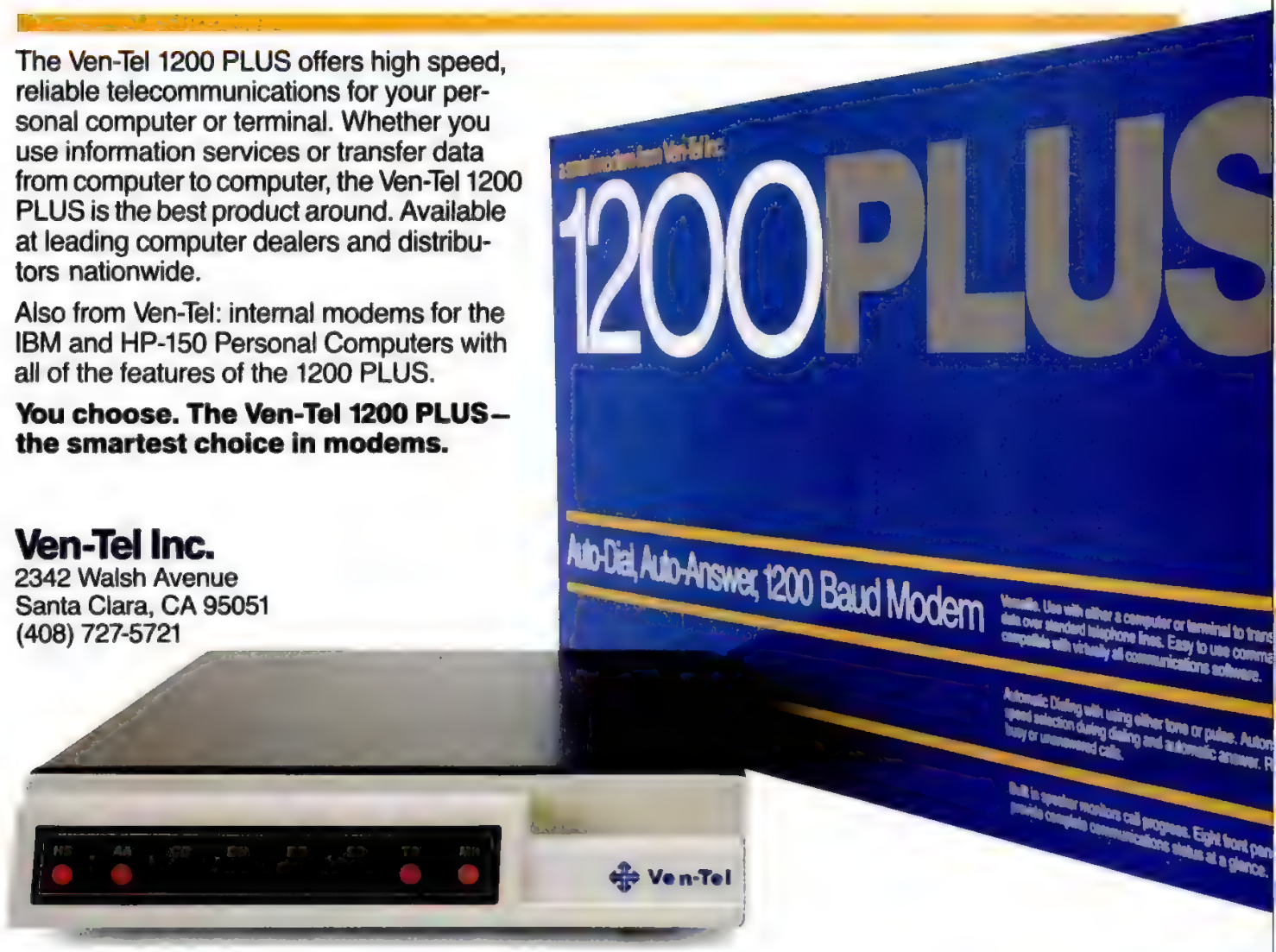
A few smart reasons to buy our smart modem:

Features	Ven-Tel 1200 PLUS	Hayes
1200 and 300 baud, auto-dial, auto-answer	Yes	Yes
Compatible with "AT" command set	Yes	Yes
Can be used with CROSSTALK-XVI or Smartcom II software	Yes	Yes
Regulated DC power pack for cool, reliable operation	Yes	**No**
Eight indicator lights to display modem status	Yes	Yes
Speaker to monitor call progress	Yes	Yes
Attractive, compact aluminum case	Yes	Yes
Two built-in phone connectors	Yes	**No**
Compatible with The Source and Dow Jones News Retrieval	Yes	Yes
Unattended remote test capability	Yes	**No**
Phone cable included	Yes	Yes
Availability	Now	
Price	**$499**	**$699**

The Ven-Tel 1200 PLUS offers high speed, reliable telecommunications for your personal computer or terminal. Whether you use information services or transfer data from computer to computer, the Ven-Tel 1200 PLUS is the best product around. Available at leading computer dealers and distributors nationwide.

Also from Ven-Tel: internal modems for the IBM and HP-150 Personal Computers with all of the features of the 1200 PLUS.

You choose. The Ven-Tel 1200 PLUS—the smartest choice in modems.



Ven-Tel Inc.
2342 Walsh Avenue
Santa Clara, CA 95051
(408) 727-5721

Crosstalk is a trademark of Microstuf; Hayes and Smartcom II are trademarks of Hayes Microcomputer Products.

CIRCLE 464 ON READER SERVICE CARD

We thought about calling it MacSimplex . . . after all it makes your IBM®PC behave like a Macintosh™ and much more . . .

and with over two years in the making, the Simplex Database Management System has features like 32-megabyte virtual memory and the most powerful networked/relational database in the microcomputer industry. Simplex was designed around how you think and the Macintosh way, so that you can use your favorite mouse to handle those mundane tasks like menu selection and data manipulation. And, if you don't have a mouse, you can use our keyboard mouse simulator, MouSim™.

Pop-up and pull-down menus, dialog and alert boxes are not just added features, they are the heart of the Simplex way. In addition, Simplex gives you both a software and a hardware floating point capability, each with 19-digit accuracy. It permits login, password, privilege, and can be used on a local area network. Simplex has full communications and a remote or local printer spooler. Above all, Simplex is modular and grows with you! Simplex also has a full-featured, English-like language which is simple to use.



You can't buy Simplex™, but it is now available as an integral part of *it's my* ***Business***™ and will be used by *it's my* ***Word***™, *it's my* ***Graphics***™, . . .

Businessmen! *it's my* ***Business*** will revolutionize the way that you handle your business. It saves time, money, and standardizes your system for all who use it. *it's my* ***Business*** comes with applications like accounting, interoffice or intraoffice mail, editing, invoicing, inventory managment, mail list, calendar, scheduler, forms and more. You can modify each of these to create applications specifically designed for you... maybe we should have called it "it's your Business".

Professionals! *it's my* ***Business*** has over 200 pages of examples and demonstrations to show you how to solve your everyday professional problems. And if these examples aren't enough, we give you a complimentary one-year subscription to Questalk™, our hands-on Simplex applications magazine.

System integrators and consultants, beware! If you are not using *it's my* ***Business*** with Simplex to solve your problems, don't be surprised when more novice programmers solve that complex math, industrial engineering, or business problem faster. We think that you can cut your concept-to-development time by an order of magnitude!

it's my ***Business*** (includes *it's my* ***Editor***) - $695.00
it's my ***Business*** Demo Disk - $20.00
it's my ***Editor*** - $100.00.

Quest Research software is available through your local computer store or through mail order from Quest Software Corporation at (205) 539-8086. 303 Williams Avenue, Huntsville, AL 35801.

Value added resellers and dealers please contact Quest Research, Incorporated at (800) 558-8088. 303 Williams Avenue, Huntsville, AL, 35801.

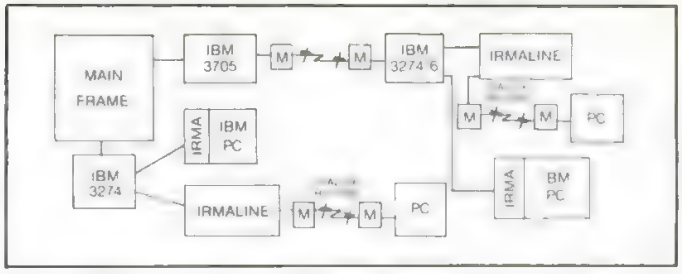
Quest™

Quest Research Inc.

IBM is a registered trademark of International Business Machines. Macintosh is a trademark of Apple Corporation. *it's my* ***Business***, *it's my* ***Word***, *it's my* ***Graphics***, *it's my* ***Editor***, *it's my* ***Home***, *it's my* ***Voice***, *it's my* ***Ear***, *it's my* ***Statistics***, Simplex, MouSim, Questalk, and the Quest logo are trademarks of Quest Research, Incorporated.

CIRCLE 493 ON READER SERVICE CARD

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically—yours from DCA, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.



IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XTs into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.

IRMA, IRMALINE, and Decision Support Interface are trademarks of Digital Communications Associates, Inc.

IRMA™ and IRMALINE™. The DCA family connections that help small computers think big.

© 1983, Digital Communications Associates, Inc.

IRMALINE™ does the same for remote IBM PCs, IBM PC XTs, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the DCA first family of 3270 micro/mainframe connections. For information, write DCA, 303 Technology Park, Norcross, Georgia 30092. Phone (404) 448-1400, TLX 261375 DCA ATL. Or call us toll-free (800) 241-IRMA.

dca®
Digital Communications Associates, Inc.

CIRCLE 444 ON READER SERVICE CARD

IBM PC and IBM PC XT are trademarks of International Business Machines Corporation. Apple and Lisa are trademarks of Apple Computer, Inc. Rainbow is a trademark of Digital Equipment Corporation.





Textra™ word processing

The shortest distance between your thoughts and the printed word.

Your thoughts come faster than your words. Capturing them smoothly and quickly is the strength of Textra, and the secret behind its success.

Textra blends advanced features with a simplified design that makes it easier to write with your personal computer. And that's what word processing is all about.

Start with the 'on-line' tutorial, which has been called everything from elegant to excellent. It's the finest introduction to a software program ever filmed. You'll be ready to write in record time.

And Textra will be ready for you. Its highly responsive full screen editor helps you put your thoughts on the screen swiftly. Automatic reformatting and on-screen bolding and underlining show you what your printed text will look like at all times. You can even preview your pages *before* they're printed, so you only have to print them once!

Whether you're searching for your first word processor, or feel miserable with the one you have now, take a close look at Textra. Ask your dealer for a demonstration today.

It's guaranteed to open your eye.

Ann Arbor Software

407 N. Main, Ann Arbor, MI 48104 Phone (313) 769-9088

© 1983, Ann Arbor Software. All rights reserved.

Textra runs on the IBM PC and compatibles and requires PCDOS (any version) 128K, and either monitor.

CIRCLE 117 ON READER SERVICE CARD

IBM Personal Computer Trends and Developments

IH News

FROM THE EDITORS OF PC

JULY 24, 1984

'Gotta Have a Gimmick'

COMDEX exhibitors go to new lengths—least of which are the actual new products—to woo dealers, users at Atlanta's digital ritual

BY CONNIE WINKLER AND BILL MACHRONE

ATLANTA — Razzle-dazzle, hype and hoopla. It hit new levels at the latest COMDEX with vendors dangling more promises, glitz, gizmos, candies, and freebie trinkets in search of dealers and users.

Despite all the hoopla, there were fewer new products than at any COMDEX in recent memory. While this, to some extent, reflects the maturation of the industry, it also means the exhibitors had to work harder for the showgoers' attention. And work they did. There was a Gatlin Brothers concert, a special screening of *Indiana Jones and the Temple of Doom*, and a host of hospitality suites.

Whereas in the past exhibit viewers accepted rigged demonstrations of products in development, this season they willingly settled for video shows of the products in action...or videos of their favorite movie personalities in action around the alleged products.

Indeed, the distinctions between software packages on exhibit blurred to the point that it was difficult, if not downright impossible, to distinguish many of the products—the ones, that is, that actually existed. A surefire way to flush them out, suggested consultant Amy Wohl during one of the sessions, was to say you have an order for 6,000 users, who need the product in 3 months.

Heavies Face Off

In the integrated package center ring were Lotus' *Symphony* and *Framework* from Ashton-Tate. Coincidentally these heavyweights ended up opposite each other, almost in the center of the main tent. Ashton-Tate turned its booth at the last minute so that the two majors weren't face to face.

Symphony and *Framework*, both announced for July, are expected to be strong competitors. Both offer word processing, spreadsheet, graphics, windowing, and an assortment of extras and nifty touches for $695. The products are at the same time alike and different, and for most

(continued)

Morrow's Pivot Rivets Attention on Lap Portables

Competitors face off with LCD screens

BY CONNIE WINKLER

ATLANTA—Highly portable portables are here to stay—or go, as is more likely with the latest showings at COMDEX, especially the petite Pivot from Morrow, Inc. of San Leandro, California.

The Pivot, with one or two 5¼ drives and an 80-character by 16-line (eventually expandable to 24 lines when the technology is available) liquid crystal display (LCD), runs MS-DOS applications and fits neatly into a smallish over-the-shoulder tote. It has four icon buttons for nifty built-in functions such as a calculator. The one-drive, 128K price, $2,495.

The clever Pivot is sure to sting other lap-size manufacturers—most of whom were at



COMDEX eyeing the Morrow machine—including Hewlett-Packard, which officially presented its $2,995 HP 110 lap portable (with built-in *1-2-3*) here (see *PC*, Volume 3 Number 11, page 39).

(continued)

Gimmick *(continued)*

users and show attendees, COMDEX was the first chance to view both products.

Ashton-Tate, which has recently hired several of Lotus' top marketing people, is promising to match Lotus' trade-in offer: Lotus' existing *1-2-3* package and $200 for *Symphony*—or *Framework*. And Ashton-Tate evened up the race even further by incorporating a communications package into *Framework*. *Mite*, a well respected if not widely used communications program, will be included with *Framework* from its first ship date in July.

Crowds of Colors

More, more, more. There were more graphics applications—Leonardo da Vinci's 360-degree man was everywhere. And there were first showings of what are being classed as business presentation graphics systems.

Also shown was Mouse Systems' *Paint*, a PC adaptation of the popular and fun *MacPaint* program for Apple Computer's Macintosh. The program, due in August, goes the Macintosh one better by adding color.

More, more, more. There were more boards and add-ons, including several to buzz up IBM's PC*jr*. And while there was the usual modicum of excitement at the IBM booth, especially over new software, there was little fawning over the *jr*. COMDEX visitors seemed to avoid the *jr* display, and one vendor with a stake in *jr*'s success suggested that vendors have become protective of the much-maligned machine, not unlike parents protecting their children.

Business Graphics

Fancy video and television terminals are already showing up as standard furniture in corporate board rooms, but now General Parametrics, a new Berkeley, Calif., company wants to put a magic box next to the monitor. The clues to the identity of the magic box are a single drive, a numeric membrane keypad, and a numeric remote control device.

The magic box is VideoShow, the $3,295 hardware portion of a big time business presentation graphics system from General Parametrics. The software is *PictureIt*, a $595 package to configure and color the graphics charts for sales or any other presentations requiring simple bar, pie, or word charts.





With *PictureIt*, the slides are designed and transferred to disk on an IBM PC or compatible. When it's showtime in the boardroom the presentation disk is played in the VideoShow, a 16-pound, Intel 8086-based, 16-bit processor with a single drive and remote control capability. General Parametrics holds that whatever else is inside the box is proprietary.

General Parametrics also is holding closely to what it calls MacroVision technology, which it says is different from the classic pixels used to create most graphics. MacroVision bypasses the classic pixel triad in favor of variable-sized groups of dots. This allows for many more variations, as many as 1,000 shades and textures, contends Herbert Baskin, president of General Parametrics Corp.

The colors immediately available in *PictureIt* coincide with a box of Crayola crayons and use the "instinctive Crayola names we all grew up with," tells one staffer. More sophisticated users can mix their own colors.

Besides any limits of the imagination, users at this point can only produce the 16 chart variations in *PictureIt*. Nor can the charts be easily fitted into other software packages—data has to be hand-transferred. And while there's a General Parametrics slide camera coming, it will only partially use digital technologies; the company also recommends Polaroid's Palette camera.

Baskin implies that these features will be coming. The hotel sneak preview of VideoShow and *PictureIt* during COMDEX was sponsored by Ben Rosen, an influential venture capitalist and big backer of Lotus' *1-2-3* and Compaq.

The company strongly believes that VideoShow will sell itself when large corporations realize how much money they can save on slide production costs. Slide costs can run as much as $80 each; as Baskin says, "VideoShow pays for itself after just one presentation."

PC Paint

If Macintosh's attractiveness could be reduced to one feature, it would be *MacPaint*. More than any other application, *MacPaint* demonstrates the utility of the mouse.

This lesson has not been lost on Mouse Systems, Inc., in Santa Clara, Calif., which previewed its *Paint* program. Of course, the package is designed to sell mice, so although *Paint* will be $125, it requires a $295 Mouse Systems mouse cursor controller.

At first peek, Mouse Systems' *Paint* appears to have all the key functions of *MacPaint*, including erase and magnify. It also uses the icons, or picture instructions, that Apple is pushing as a standard. Unlike *MacPaint*, however, Mouse Systems' *Paint* can produce curved lines and, in rubber band fashion, expand and contract them.

The program has three type fonts. The color screen's relative coarseness makes the characters somewhat less attractive than the Mac's—although still pleasant.

Women's Ware

Is there a "women's market" for software? The Neon Software Co. in Middletown, Conn., is going to find the answer, although it may be affected by the slow progress of IBM's PC*jr*.

At the first public viewing, however, vice president Ed Wennerstrand reported good responses, and indeed there were more women than men at the company's booth.

Women's Ware is seven $49.95 packages designed for any busy person who needs easy-to-learn and useful home software. The programs are particularly aimed at today's two-career women. As an enticement to purchase additional packages, each contains a $5 coupon toward the next one.

Wennerstrand also plans regional advertising campaigns using coupons to entice women into their local dealers. The seven packages are budget, calendar, checkbook, recipe, directory (addresses and special dates), filebox (to replace the family's junk drawer), and freefile (to track whatever the user wants).

Women's Ware has another curious gimmick: Its product is packaged on a hanger in the store display.

Is the hanger (which conjures up women's horror stories) or the product name itself—Women's Ware—derogatory to women? Wennerstrand says he put the question to Gloria Steinem, with whom he had worked on a stereo loudspeaker promotion in his previous career, and she had no problem with either sensitivity. ■

Morrow *(continued)*

A Hong Kong company, International Quartz, Ltd., is also pushing LCD technology in its products. Another computer sporting the 80-character by 25-line LCD screen (the equivalent of the PC monitor) was the STM Portable PC from Semi-Tech Microelectronics of Toronto (see *PC*, Volume 3 Number 13, page 33).

These new machines demonstrate that lap-sized isn't necessarily lap-top any more.

Riveting Pivot

Limited quantities of the Pivot will be available in August through dealers who already carry Morrow's Micro Decision Systems, said Ed Niehaus of Morrow, who reported "very favorable" responses at the COMDEX initial viewing. Niehaus guessed that the 25-line LCD screen may be available on the Pivot by the second quarter, 1985. Screen resolution on the Morrow is 480 × 160 pixels.

The Pivot is based on the Harris CMOS 80C86 processor and can run up to 4 to 6 hours on the internal, rechargeable ni-cad battery, Niehaus said. (This is one of the first announced portables to use the Harris CMOS 80C86, which experts expect to become increasingly popular.) Otherwise the pivot runs on a 115-volt power supply that hangs on the wall.

The icon function keys—telecommunications, built-in modem, clock, and calculator—allow the user to pivot from the application underway, such as word processing, to the calculator and then quickly back to word processing, for example. Pivot bundles the *NewWord* word processor which Niehaus described as similar to *WordStar* with easy menus.

Because of the LCD screen, the Pivot does not have bit-mapped screen compatibility, so it will run only those vanilla MS-DOS 2.x programs that are not dependent on IBM ROM and screen calls, Niehaus said.

The Pivot weighs 9 pounds, measures 13-by-5.6-by-9.5 inches, and has one or two Oki drives on the side. The $2,495 model will come with one drive and 128K RAM, with upgrades to 512K. There are three ports: a parallel port that mimics IBM PC I/O; an RS232C serial port with programmable baud rates from 300 to 19.2K baud, synchronous, or asynchronous; and a RJ11C port to connect the modem to telephone lines.

Pivot is the first MS-DOS machine for Morrow, headed by flamboyant George Morrow. Until now the company developed and marketed 8-bit CP/M systems, notably the aggressively priced Micro Decision systems.



All-in-one: International Quartz's 35-pound Model 9230

Meet the Competition

International Quartz has come up with three variations on the portable theme, two of which incorporate a printer into a 35-pound unit. Two also have LCD screens.

International Quartz, a subsidiary of The Chiaphua Group, one of the Orient's largest diversified corporations, is looking for OEM contracts and other remarketing proposals, said C. H. Ng, vice president of operations for the Hong Kong company.

The three 16-bit, Intel 80186 machines—all PC compatible according to the company—integrate various technologies in interesting ways.

Most curious is the Model 9230, which has a 25-line LCD screen that swings out for adjustment and a "high-quality dot matrix printer."

The keyboard is detachable so that the three-line screen and ROM can be used like a transportable. Further, the built-in modem allows the keyboard to communicate with the main unit via telephone.

The 9230 firmware includes the *Interquartz Memowriter*, 600-baud serial communications with the main unit, user-definable function keys, eight-digit calculator and a real-time clock and calendar. Cost on all the machines will be approximately 20 percent less than comparable U.S. versions, Ng said.

Model 9231 is similar in all respects except it has a 9-inch amber CRT screen instead of the LCD.

Model 9240 is a 15-pound lap portable with a 25-line LCD screen flipping up in cigar-box fashion like the Hewlett-Packard 110. It runs both MS-DOS and CP/M-86. ■

Speaking of Computers: Don't Touch that PC!

"We're selling our desks, tables, cabinets, everything but our personal computers," John Glenn's campaign treasurer Bill White told *Washington Dossier*, describing the efforts underway to wipe out the Ohio Senator's $3 million campaign debt.

The New York Post*'s "Page Six" department, May 21, 1984*

SELECTION. QUALITY.



Save space and protect your PC with our unique StowAway™ drawer

NEW!

The StowAway is a drawer which stores your keyboard when not in use, and a keyboard stand when the drawer is opened. Behind the keyboard is drawer space for disks, keyboard overlays, whatever. The keyboard stays connected at all times.

The rugged metal construction of the outer case allows 100 lbs. of computer equipment to stand on top. That's strong enough for three PC XT's. And the drawer is so sturdy, it easily supports the keyboard when extended beyond the desk edge.

The StowAway reduces the "footprint" of your PC. It allows you to install and run a PC on a space only 16 by 16 inches such as a narrow typewriter return. Our composite photo shows this: • above, a StowAway with an IBM PC on top and the keyboard tucked away in the drawer, • below, the StowAway by itself with the keyboard drawer extended. Version B (shown) locks the drawer with the keyboard in it, effectively disabling the computer to unauthorized users. Version C takes security to the limit. It bolts through the table top and clamps without harm to the PC (with access to its fasteners safe inside the locked drawer). Anyone wishing to make off with your computer will find a telltale desk hanging from it.

In style and color, the StowAway blends right in with your IBM® PC.

Version A: StowAway Housing & Drawer	X100A	$ 94.50
Version B: Plus Lock	X100B	$119.50
Version C: Security Bolts & Clamp	X100C	$169.50

Diskettes: top notch labels at rock bottom prices

We want PC Brand to become your source for supplies. So here's our inducement: only the premier brands, only at bargain prices. All the following are 5¼", soft-sectored, double density, with reinforced hubs. SS and DS stand for single- and double-sided:

Brand		Product	Box of 10
IBM	SS	D1101	30.90
IBM	DS	D1102	39.90
3M	SS	D1501	25.90
3M	DS	D1502	35.90
Maxell	SS	D2001	30.90
Maxell	DS	D2002	42.90
Memorex	SS	D2301	26.90
Memorex	DS	D2302	35.90
TDK	SS	D2801	30.90
TDK	DS	D2802	42.90
Verbatim	SS	D3201	27.90
Verbatim	DS	D3202	36.90

Ribbons for the most popular printers

With our low prices you can afford frequent changes to keep your hard copies from going soft. Don't be stranded with an overworked ribbon when that important report comes along. Always be ready to make a good impression. Order several today for lowest prices.

Printers	Model	Product Nrs.	Price Each
Epson (IBM)	MX-FX-80	R0301	7.95
Epson	MX-FX-100	R0302	11.45
NEC	3550 M/S	R4001	17.50
Okidata	80,82,83	R2501	2.45
Okidata	Microline 84	R2502	6.50
Juki	6100	R3700	2.45

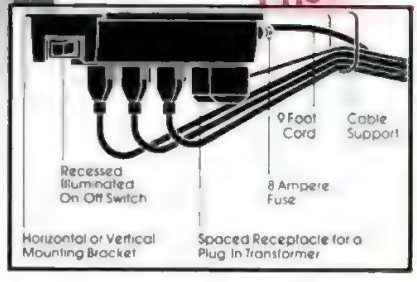
The Wire Tree™: Clean power *and* a clean desk!



Power spikes can erase memory, destroy disks, and damage equipment. They're not worth risking. Ask us for The Wire Tree to protect your computer's circuits from harmful voltage surges, and you will get all these features in the bargain: It can attach to the underside of a desk to remove unsightly power cords from view (see diagram), turns four components on and off with a single illuminated switch, has its own 8 amp fuse, and 9 foot cord

Product N0050 $49.95

Specially Priced



Paper in a mix of weights and measures

We stock full-size boxes and convenient mini-packs to fit your most likely requirements. 'Perforated lets you tear off the vertical pin-feed holes and yields smooth-edged 8½" by 11" pages for correspondence, filing, and notebooks. 20 lb is full thickness and bright white. 15 lb is for higher volume or economical printing.

	Size		Quantity	Weight	Product Nr.	Price
Full Boxes:	14 7/8" by 11"		2500 sheets	20 lb	P1420	39.95
	14 7/8" by 11"		3400 sheets	15 lb	P1415	44.95
	9 1/2" by 11"	Perf	2500 sheets	20 lb	P1920	28.95
Mini-Pack	9 1/2" by 11"	Perf	1000 sheets	20 lb	P0920	19.95

Our Craftsman™ programming tools will make you a 'C' professional

If you are a software developer, you know that C has become the language of choice among professionals. PC Brand has the complete line of today's most finely crafted C tools, and all of them at a full 20% off list price. Any selection from our Craftsman workbench will give your productivity a powerful boost.

Lattice C® : The preeminent 16-bit C compiler. It "produces remarkable code. . . outstanding in terms of both execution speed and code compactness" *(Byte)*. "The best for software development" *(PC Tech Journal)*. Supports DOS 2 Path Names and Large Memory model.
Product S0100, $295.00

C-Food Smorgasbord™: A library of difficult to prepare C functions which would take months to write and perfect but which your application can effortlessly reference to get the job done. Product S0200 $115.00

Halo™: A spectacular graphics extension to Lattice C. Provides a complete library of graphic functions. Over 100 commands for plot, line, arc, box, circle, pattern-fill and dithering for impressive texture and color mixes; rubberbanding for shapes; fill and flood to paint areas. Extraordinarily powerful. Requires IBM Color Graphics card, Hercules card, or compatible equivalents. Product S0300 $125.00

Panel™: Designing custom screens is no longer intricate, time-consuming, and costly. Generates C source code supporting field descriptors, color and highlighting, input editing by type of field, help keys, and warning messages. Product S0400 $235.00

Plink86™: Shoe-horns large programs into small memory with overlay manager. Plink86 will set you free to write the comprehensive code today's users l sacrifices to memory constraints.
Product S0500 $315.00

Pmate™: A full screen editor designed for programmers. Includes ten auxiliary text buffers, and Undelete. Pmate calculates, has variables, if-then-else statements, loops. You can write compact "macros" to delete comments, check syntax, alphabetize lists, do row and column math, even summon other macros. The most powerful editor available. Needs only 64K. Product S0600 $175.00

All products operate on the IBM PC or PC/XT under PC-DOS, require 128K (unless otherwise noted), and are fully supported by telephone assistance. If you already know these products, you recognize the dramatic savings we offer. If you need more information, we have complete specification brochures for each product. Just give

Prices, terms and specifications subject to change without notice. PC Brand, StowAway, and Craftsman are trademarks of PC BRAND.

VALUE. SPEED. OUR DIME!SM

Finally, a true letter quality printer for less than $500!



PC Brand pioneered this breakthrough price with the Juki 6100. Real daisy wheel typing, bi-directional logic, even proportional spacing for only $499.

80 Micro magazine "studied three other daisy-wheel printers under $800 and came to the conclusion that the Juki 6100 was by far the best choice. It's smart, has plenty of features . . . the print quality is excellent." That's because the Juki uses print wheels and ribbons designed not for computer printers but typewriters — where standards for "letter quality" are set. Smart? The print wheel simply drops into place; the printer engages it automatically!

Fast? The Juki is rated at 18 characters a second. But logic-seeking bi-directional printing and high speed motion over blank spaces means typing speed for typical text equals printers with much faster ratings. *Creative Computing* says "the Juki [is] much faster than other low cost daisywheels . . . the printhead absolutely flies over white space." And there is a built-in 2,000 character buffer.

Quiet? Better than 62 dBA from 1 meter away. No raucous clatter. A big improvement over some printers we listened to. We benchmarked the Silver-Reed EXP 550, Brother HR-1, and Smith-Corona TP-1 and found them two to eight times noisier. *80 Micro* agrees: "The Juki 6100 is one of the quietest daisy-wheel printers." Reliable? Ask an engineer about an MTBF of 2500 at 25% duty. Other printers employ intricate wires, pullies, and springs. They derail, and go out of adjustment. The Juki is elegantly simple, with few moving parts: the print head is drawn across a rail by magnetic attraction.

Versatile? It prints at 10, 12 and 15 characters/inch on a 13 inch platen (11 printable inches). Also supports proportional spaced print wheels. Under software control there are almost 50 codes for graphics, special type wheel characters, and even reverse direction paper feed. Spacing can be controlled up to 1/120th of an inch horizontally and 1/96th inch vertically for the fussiest forms printing. We offer an economical and reliable bi-directional forms tractor as an option for continuous stationery. Works with up to 7-part stock!

Compatibility? The Juki 6100 behaves like a Diablo 630 with your software, and has a parallel interface, fully compatible with your IBM PC, XT, or look-alike.

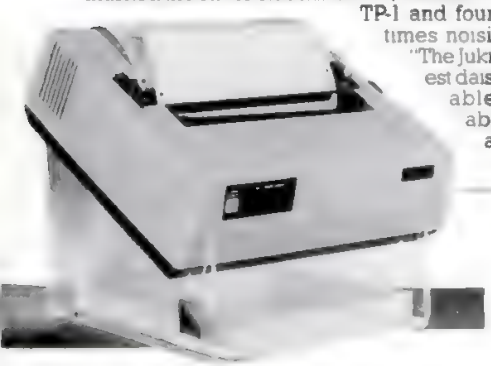
"In a feature-by-feature comparison, the Juki outstrips anything in its class" is *Creative Computing*'s conclusion.

So try it! There's a 90 day limited warranty for parts and labor. And if you don't agree that the Juki is an extraordinary value, return it within 30 days for refund of all but shipping and handling. Call us now.

Ribbons and print wheels for the Juki

The Juki uses low-cost single- or multi-strike IBM Selectric® II ribbons, and doubly-molded plastic Triumph Adler print wheels with up to 100 characters in 26 styles rated a phenomenal life expectancy of 10,000,000 characters. PC Brand has them all.

Juki 6100		
Product J6100		$499
IBM Cable		
Product J6120		$ 29
Bi-Directional Forms Tractor		
Product J6150		$129



A printer stand with a new angle NEW!

Printer stands put the paper under the printer to save space. This one, in clear Lucite™, tips your printer forward. You can read what it's printing without continually getting up and leaning over. Its height delivers fanfold output. Its open top U shape is perfect for printers which feed paper through the bottom. To fit your printer, choose the size which most nearly fits its platen (roller) length:

M0912	10" platen (plus or minus)	$34.95
J1512	13" "	$44.95
M1512	15" "	$49.95

Keep your disks safe from mishap

Of all the disk storage schemes we've offered, the Lock Box is clearly the favorite. Our two sizes hold 35 and 85 diskettes, have clear plastic covers, and two keys to discourage borrowing and unauthorized browsing. Protect your disks from spills, dust or smoke particles, and organize your workplace in the bargain.

V1035	$29.75
V1085	$42.50



We make a great case for portability NEW!



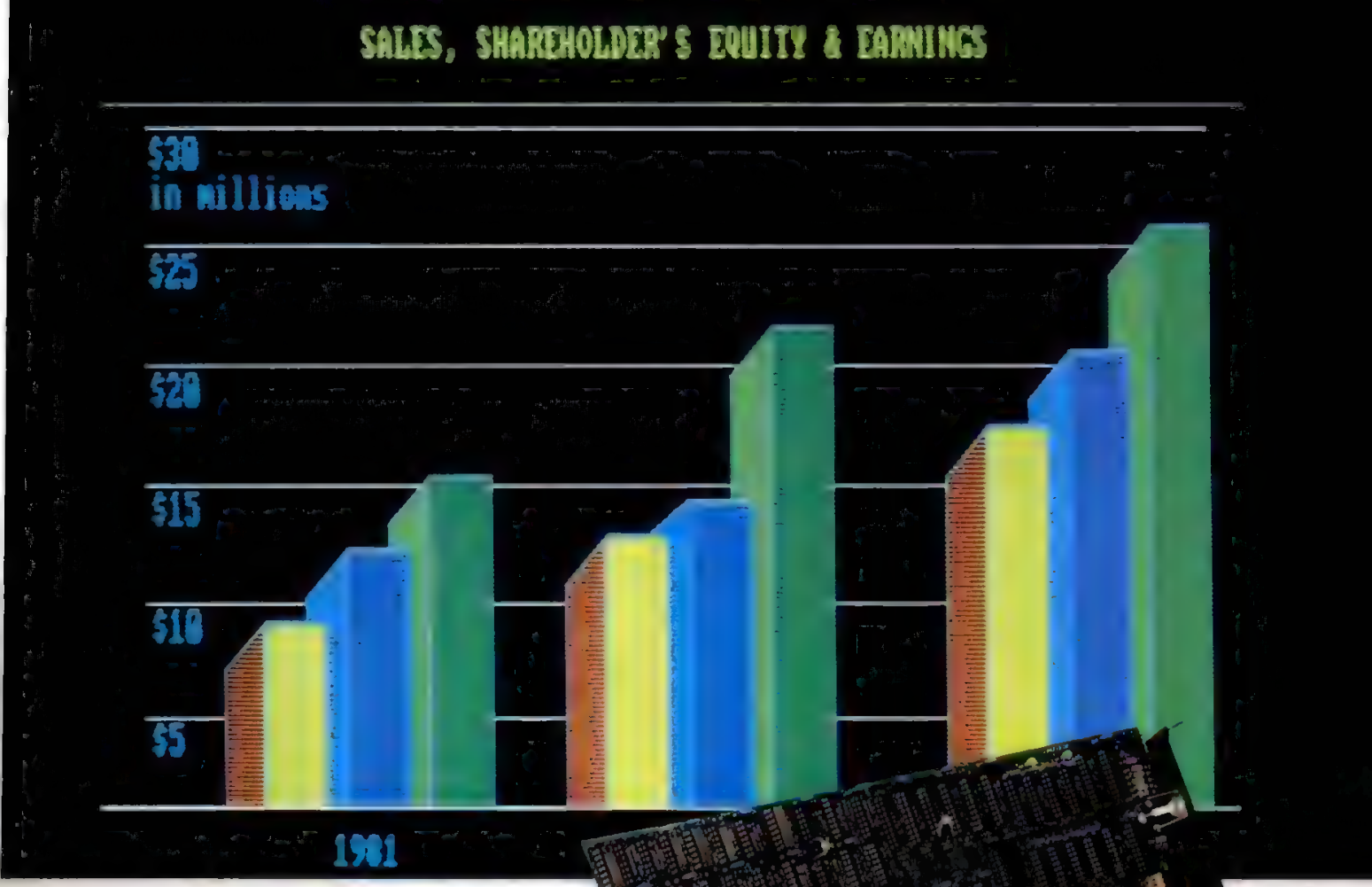
Maybe not today, perhaps not tomorrow, but some day you will want to take your PC or XT with you, or ship it somewhere. That's when you will discover why portables have caught on. Yours isn't at all. Be prepared for that last minute situation. Our parallel line of carrying and shipping cases are fully foam padded and have industrial locks, corners, and frames for rugged durability.

	Carrying		Shipping	
PC or XT & Keyboard	T8314	$149	T8342	$229
Monitor & MX-80	T8315	$159	T8343	$239
Monitor & FX-80	T9666	$179	T9541	$259

CIRCLE 288 ON READER SERVICE CARD

1-800-PC BRAND

That's 1-(800) 722-7263. In NY State call (212) 410-4000.
Minimum order $20.00. Charge it to MasterCard or Visa.
Or mail your order and check to the address below.
Ask about corporate accounts. Shipping and handling extra.
PC Brand, P.O. Box 474, Dept. 7A, New York, N.Y. 10028. © PC Brand 1984



QUADCOLOR™ BY QUADRAM™

Enhance the graphics capabilities of your IBM Personal Computer and XT. With Quadcolor by Quadram. The color graphics adapter set packed with bright ideas about color and graphics.

BRILLIANT COLOR AND GRAPHICS FOR YOUR IBM® PC OR XT.

Begin with Quadcolor I
Snap Quadcolor I into your PC to drive any type color monitor, even your home television set. Then take advantage of Quadcolor I enhancements to brighten up your program work. Enhancements like 32K of on-board memory, for up to 16 active video pages in 40-column text mode. Or 8 pages in 80-column. (That's twice what other popular cards offer.) Switch to graphics mode and create two complete screen pages in memory. Edit them separately for Quadcolor I special effects like animation.



Plus, Quadcolor I gives you two true colors in high resolution mode. So there's no need to limit yourself to just black and white anymore.

Expand with Quadcolor II
As your needs grow, expand to Quadcolor II with an upgrade board and discover the brilliance of *advanced* color graphics. Like a full 16 color high resolution mode and an amazing *136 color* medium resolution mode. Plus Quadcolor II comes complete with BASICQ, the software package that enhances IBM's BASICA graphic commands to increase your programming options (such as overlaying text on high resolution graphics). And when you're in the mood for a little fun, Quadcolor II provides a game port for your use.

Pick the set that's packed...
Only Quadcolor packs so many bright ideas into one color graphics adapter set. Backed by the solid tradition of Quadram Quality. Visit your local retailer soon for a demonstration, then picture it for yourself on your own IBM PC or XT. You'll agree. For brilliant, advanced color graphics capabilities, it's Quadcolor by Quadram. A bright idea whose time has come.

QUADRAM QUALITY™

QUADRAM™ CORPORATION
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

IBM, IBM PC and IBM XT are registered trademarks of International Business Machines Corporation

© COPYRIGHT 1984 QUADRAM CORPORATION ALL RIGHTS RESERVED

CIRCLE 251 ON READER SERVICE CARD

Add-On Drives Help PCjr Grow Up



The Drive Two Enhancement Package, from Rapport Corp., expands the PCjr.

ATLANTA—If IBM's PC*jr* is in troubled waters, several manufacturers are gushing in with bridge products to raise Junior's power to the level of a PC.

Because the Junior uses off-the-shelf parts, these vendors are able to simply add parts to what IBM clumped together.

Rapport Corp., headquartered in North Salt Lake City, Utah, introduced a $675 unit that snaps on top of the Junior, which includes a second drive, 256K RAM, an additional memory slot, and separate power supply. An additional 256K is $275.

"Dealers will find it easier to sell the PC*jr* bundled with the Rapport enhancements," said Rod Crisp, Rapport's vice president of marketing. And PC*jr* users who have outgrown their systems will be relieved.

A similar scheme comes from Legacy Technologies in Lincoln, Nebraska, which has even added a hard disk to PC*jr* with its Legacy III system for $1,795. The Legacy II, a floppy configuration with expansion slots up to 640K, is $795.

Tecmar's contribution to the Junior brigade is an add-on second floppy disk drive. The initial version of this product provides little else besides the disk, but a future version, due at the end of the summer, will incorporate the additional memory, real-time clock, and expansion ports found on Tecmar's current Junior Captain board. A Tecmar hard disk unit is likely to follow the upgraded floppy unit to market in the early fall.

For more information, contact the manufacturers.

Rapport Corporation
80 S. Redwood Road
North Salt Lake City,
UT 84054
(801) 292-9454

Legacy Technologies, Ltd.
4817 North 56 Street
Lincoln, NE 68504
(402) 466-8108
or (800) 228-7257

Tecmar Inc.
6225 Cochran Road
Cleveland, OH 44139
(216) 349-3377 ■

Honeymoon Is Over Between Bruce & James and Simon & Schuster

"We were the guinea pigs. We may be only the first to get burned," says Bruce.

BY MARTIN PORTER

NEW YORK—If Bruce & James was an experiment to see if computer software could merge with traditional book publishing—let it be known that the guinea pig nearly died.

That celebrated software partnership inked a distribution deal with Simon & Schuster in 1983, to the tune of a projected $100 million in sales for their Visionline of software. Its first product was *WordVision*, a $79.95 word processor for the IBM PC.

Bruce & James Chairman Bruce McLoughlin admits to financial problems, but maintains that his software publishing company hasn't closed up shop. However, *PC Magazine* has learned that six employees were laid off, and the company has been forced to trim the service hours of its toll-free information phone number. McLoughlin says a break in relations with Simon & Schuster may be the cause of recent bankruptcy rumors.

Problems between the two parties arose recently when Simon & Schuster withheld a scheduled May 1 payment to Bruce & James. McLoughlin claims that Simon & Schuster said it expected returns on the product to exceed a 20 percent reserve pool that had been established to handle returns.

"The marriage between software and book people has turned into a giant nightmare," says McLoughlin. He claims that Simon & Schuster breached its contract by withholding the money due and he called litigation "possible," though "extremely costly."

However, Alvin Reuben, executive vice-president of Simon & Schuster's Electronic Publishing Division says that the contract may have originally been breached by Bruce & James when it delivered *WordVision* 6 months late. He adds that sales of the product have only been hurt by a lack of promotion and advertising on the part of the Dublin, Ohio-based software firm—another of Bruce & James' contractual obligations.

Troubled Rumblings

Signs of trouble at the much-publicized software firm came even before the title was commercially available, when Jim Edlin (the "James" in the partnership) left the company in what McLoughlin describes as a "parting of ways" in December 1983.

WordVision's price tag originally had been set at $49.95, but was upped $30 at retail to cover the cost of special key caps and the toll-free help number.

While there have been some rave reactions to the inexpensive word processor, a *PC Magazine* reviewer said, "Though it has more than a couple of nifty things going for it, *WordVision* is so quirky and idiosyncratic that it may be your one-way ticket to involuntary servitude." (See "Taking a Gamble with WordVision," *PC*, Volume 3 Number 6).

McLoughlin estimates that *WordVision* unit sales are in the 17,000 to 18,000 range. At the same time, Reuben says that returns so far haven't been "out of line" and describes sales reports as "fair." So where's Simon & Schuster's beef?

Reuben adds that the dispute is complicated by the fact that there were actually two contracts involved. He says that a

(continued)

Calling Micro Mart™ Can Be Music To Your Ears

Micro Mart is more than mail order. We are a multi-million dollar production, orchestrating your favorite PC hardware and software at superb discounts—all accompanied by great service and technical support.

Find out what our biggest critics (our Fortune 500 accounts) already know. Our selection is above measure. Each of our consultants are virtuosos in personal productivity and our discount savings will tickle your ivories.

We're playing your tune in the heart of distribution, not just fiddling about "the Old Mill Stream." So check out the score of state-of-the-art PC products in the rear of this magazine and give us a ring. Ask for expert advice and your best price.

Also Appearing Daily In:
Atlanta • Charlotte
Washington DC • Tampa
Louisville • Showrooms
Coming Soon To:
Ft. Lauderdale • Orlando
New Orleans
Micro Mart Computer Centers
See our 2-Page Ad in Rear of Magazine

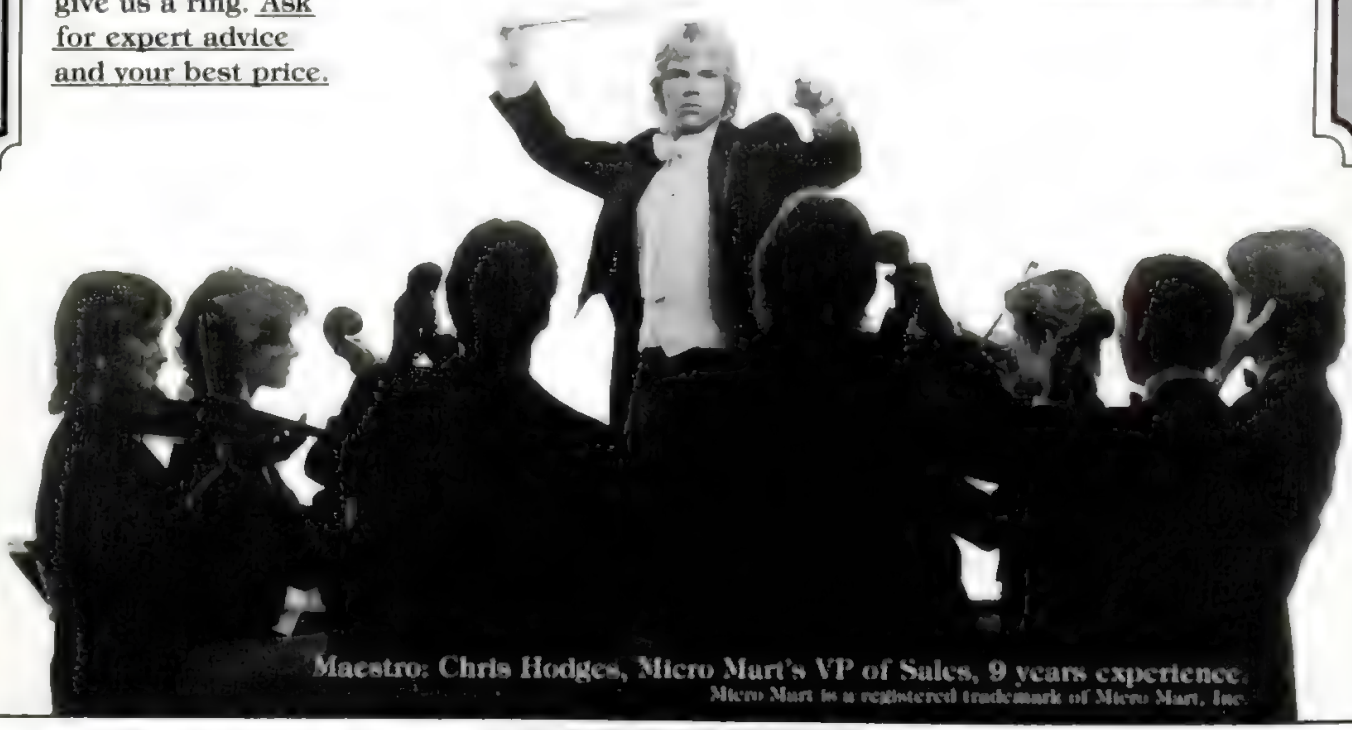
America's PC Specialists

MICRO MART™

Technology Corporate Campus
3159 Campus Drive•Norcross, GA 30071

Orders Only 1-800-241-8149
For Information 1-404-449-8089

Show Our Ads To Your Purchasing Agent



Maestro: Chris Hodges, Micro Mart's VP of Sales, 9 years experience.

Micro Mart is a registered trademark of Micro Mart, Inc.

CIRCLE 478 ON READER SERVICE CARD

Honeymoon *(continued)*
second agreement had been reached in order to help McLoughlin secure additional funding for his financially flush corporation. Simon & Schuster's position remains that, since that financing was never secured, the second contract is invalid. This gives Simon & Schuster a different payment schedule than the one McLoughlin had been expecting. Reuben says that Simon & Schuster's current action is based on the original agreement.

"No Comment"

John Brockman, the New York literary agent responsible for the Bruce & James, Simon & Schuster contract, issued a firm "no comment" about the current state of affairs between the two companies.

Still, there's no souring on Reuben's part about the viability of software sales in book outlets. The company is scheduled to ship its first "self-published" software title—*Typing Tutor III*—in June. "Software will sell in bookstores, it just needs the promotion to pull it out to the market," Reuben says.

Then there is McLoughlin's lament: He claims that, with his contract with Simon & Schuster broken, he is hoping to secure different product distribution through more traditional software channels.

Meanwhile, Jim Edlin hasn't entirely vanished from the picture. He says that negotiations for his return to a management position with the company are currently in gear. And about the Simon & Schuster situation he will only comment, "Bruce & James has made every mistake in the book, except for one—we produced a product that is beloved by its customers."

He claims that it is because of the market reaction to the product that Bruce & James may rise again, "very much like the Chrysler Corporation."

And though McLoughlin is equally optimistic, he issues a word of warning: "We were the guinea pigs. We were the first ones out. We may be only the first to get burned." ■

Visi Ever Onward with Visi On Word

BY JAMES LANGDELL

LOS GATOS, Calif.—*Visi On Word* is finally available, bringing VisiCorp closer to completing the basic components in its Visi On environment. (See *PC*, Volume 3 Number 4, page 51.) Now that Visi On can field integrated spreadsheet, graphing, and word processing applications, VisiCorp cut the price of this complete Visi On package from $1,365 to $795 for 6 weeks. This price cut might succeed in attracting customers at a time when other integrated products, such as Lotus' *Symphony* and Ashton-Tate's *Framework*, were yet to appear. This package includes the Visi On Mouse and *Visi On Application Manager, Calc, Graph,* and *Word* software packages.

According to VisiCorp's chairman, Dan Fylstra, this discount is part of the company's strategy to penetrate the Forbes-1,000 companies. The lower price and in-house demonstrations by VisiCorp's "major account missionary teams" are aimed at encouraging large corporations to obtain evaluation copies of Visi On for comparison with other integrated business software packages they may be considering for multiple purchases.

When the promotional period ends, *Visi On Word* will be priced at $375. As to the availability of *Visi On Query*, the relational database analysis module that was announced last winter, VisiCorp has set no new date.

VisiSeries Slashes

Along with the temporary Visi On price cut, VisiCorp is making permanent price slashes in its VisiSeries software for the IBM PC. For example, *VisiCalc* Version 1.2 (which can run on PC*jr*) drops from $250 to $99—about the same price as Software Arts' *Advanced Version VisiCalc*. *VisiTrend/Plot* drops from $300 to $99, *VisiFile* from $300 to $149, and *VisiWord Plus* (which includes a spelling checker) from $375 to $195. *VisiSchedule* (now $195) and *VisiLink* (now $149) also have lower prices. The VisiSeries spreadsheet with graphing functions, *VisiCalc IV*, is still $250, however.

Another Flash

VisiCorp also released *FlashCalc*, a new spreadsheet for the Apple II family priced at $99. Unlike *VisiCalc*, which bypasses the Apple's operating system, *FlashCalc* runs within Apple's new ProDOS. VisiCorp's new program was written by Bill Graves of Nereid Systems, Inc., a software developer in Manhattan Beach, California.

FlashCalc is the first VisiCorp product that doesn't include *Visi* in its name, perhaps because of the ongoing lawsuit between VisiCorp and Software Arts (the developer of VisiCalc) over who has the right to sell *VisiCalc* and use the *Visi* trademark. Legal restraints also kept VisiCorp from commenting on differences between *FlashCalc* and *VisiCalc*, although its promotional material pointed out some advantages of *FlashCalc* over the Apple versions of *Multiplan* and *SuperCalc*^{2}.

VisiCorp has not yet announced versions of *FlashCalc* for any IBM computers. Since it requires only 64K RAM on the Apple machines, the PC*jr* should be able to run any PC-compatible version that does appear. ■

Phoning Home for Help—$380

BOCA RATON, Florida—PC users with questions about selected IBM software can now phone home for help.

Home is IBM's PC headquarters here, where IBM has started a subscription-only Software Support Center to provide prompt answers to difficult technical questions.

A $380 subscription fee buys seven single-topic phone calls "of moderate duration"—less than half an hour. Subscribers call in on a toll-free phone line, first giving the name of the program they need to discuss. IBM promises that a programming specialist will call back before long.

Support Center subscribers will also receive a disk-based monthly newsletter containing technical tips, announcements of new IBM products, and product updates. Extra newsletter subscriptions cost $30 each.

"We don't envision that the average consumer will need this type of in-depth service. For applications programs, like *PeachText* or *EasyWriter*, most people would call their dealers," says Jill Liscom of IBM. "This service is geared toward more sophisticated, technical questions. We expect it might be used by someone in an office, perhaps a programmer or a software developer."

IBM promises to continue the service, which was launched in February, until at least January 31, 1985, when the company will evaluate its success. So far, says Liscom, response has been good.

The Center handles inquiries about APL, Asynchronous Communications, BASIC, the BASIC Compiler, the BASIC Programming Development system, the *Cluster Program*, COBOL, DOS, FORTRAN, Logo, the Macro Assembler, Pascal, *Personal Editor, PCWriter, Private Tutor, Professional Editor*, SORT Version 1.00, and *Word Proof*.

The Center is open from 10 a.m. to 6 p.m., Eastern Time, Monday through Friday. Call 800-IBM-2700.

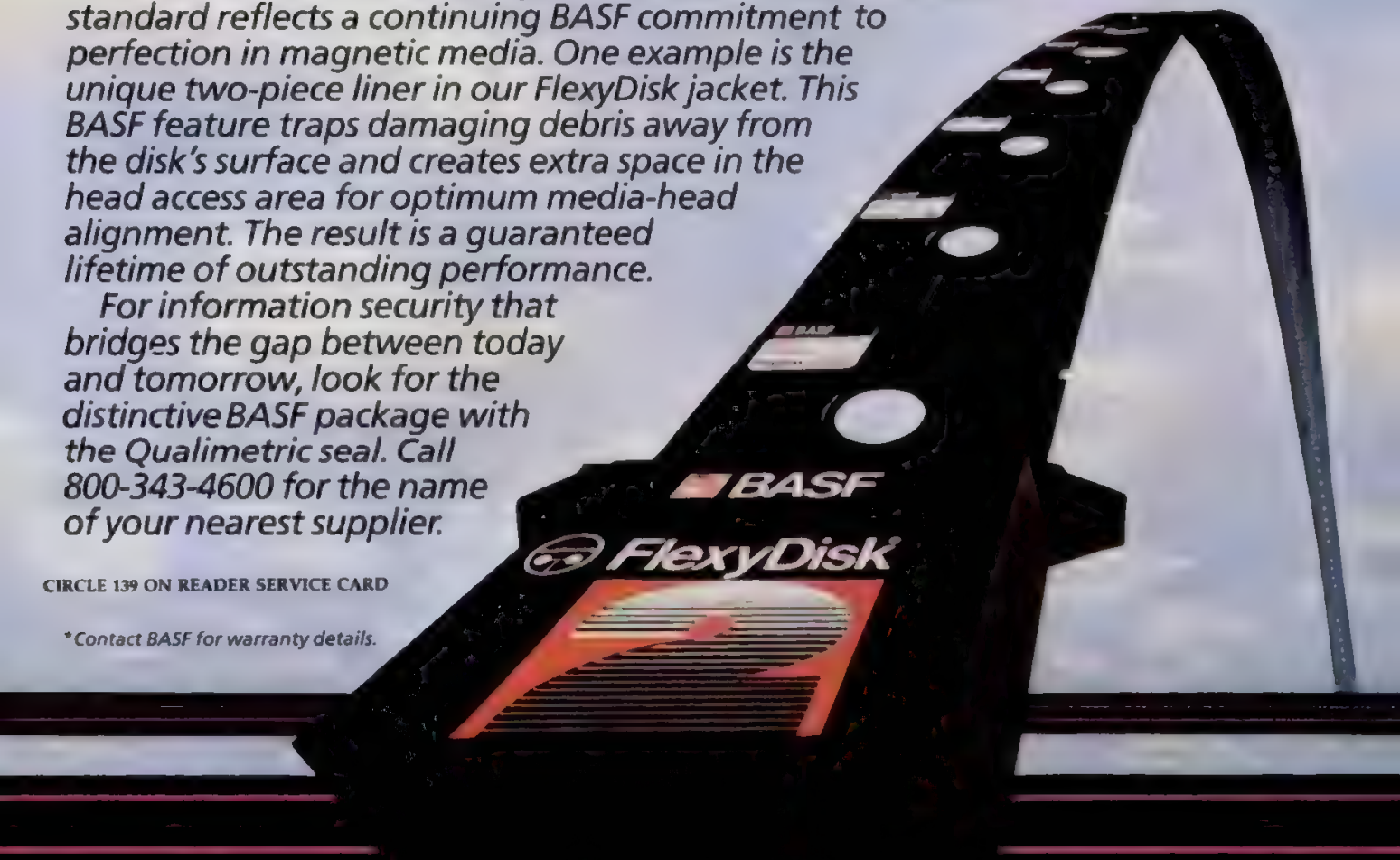
—Karen Cook

BASF QUALIMETRIC™ FLEXYDISKS®. A GUARANTEED LIFETIME OF OUTSTANDING PERFORMANCE.

BASF Qualimetric FlexyDisks feature a unique lifetime warranty, firm assurance that the vital information you enter on BASF FlexyDisks today will be secure and unchanged tomorrow. Key to this extraordinary warranted performance is the BASF Qualimetric standard... a totally new set of criteria against which all other magnetic media will be judged.*

You can count on BASF FlexyDisks because the Qualimetric standard reflects a continuing BASF commitment to perfection in magnetic media. One example is the unique two-piece liner in our FlexyDisk jacket. This BASF feature traps damaging debris away from the disk's surface and creates extra space in the head access area for optimum media-head alignment. The result is a guaranteed lifetime of outstanding performance.

For information security that bridges the gap between today and tomorrow, look for the distinctive BASF package with the Qualimetric seal. Call 800-343-4600 for the name of your nearest supplier.



CIRCLE 139 ON READER SERVICE CARD

**Contact BASF for warranty details.*

ENTER TOMORROW ON BASF TODAY.

BASF

© 1983 BASF Systems Corp., Bedford, MA

Copyrighted material

This is THE PASCAL COMPILER You've Been Hearing About



"It's almost certainly better than IBM's Pascal for the PC... Recommended."
Jerry Pournelle
Byte, May 1984

$49.95

"If you don't have CP/M [for your Apple], Turbo Pascal is reason enough to buy it."
Cary Hara
Softalk Apple, May 1984

"If you have the slightest interest in Pascal . . . buy it."
Bruce Webster, *Softalk IBM*, March, 1984

And Now It's Even Better Than You've Heard!

- **Windowing (IBM PC, XT, jr. or true compatibles)**
- **Color, Sound and Graphics Support (IBM PC, XT, jr. or true compatibles)**
- **Optional 8087 Support *(available at an additional charge)***
- **Automatic Overlays**
- **A Full-Screen Editor that's even better than ever**
- **Full Heap Management—via dispose procedure**
- **Full Support of Operating System Facilities**
- **No license fees.** You can sell the programs you write with Turbo Pascal without extra cost.

Yes. We still include Microcalc . . . the sample spreadsheet written with Turbo Pascal. You can study the source code to learn how a spreadsheet is written . . . it's right on the disk.* And, if you're running Turbo Pascal with the 8087 option, you'll never have seen a spreadsheet calculate this fast before!

**Except Commodore 64 CP/M.*

Order Your Copy of TURBO PASCAL® VERSION 2.0 Today

For VISA and MasterCard orders call toll free: **1-800-227-2400 x968**
In California: **1-800-772-2666 x968**
(lines open 24 hrs, 7 days a week)
Dealer & Distributor Inquiries Welcome 408-438-8400

Choose One (please add $5.00 for shipping and handling for U.S. orders. Shipped UPS)

____ Turbo Pascal 2.0 $49.95 + $5.00
____ Turbo Pascal with 8087 support $89.95 + $5.00
____ Update (1.0 to 2.0) Must be accompanied by the original master $29.95 + $5.00
____ Update (1.0 to 8087) Must be accompanied by the original master $69.95 + $5.00

Check ____ Money Order ____
VISA ____ Master Card ____
Card #: _____
Exp. date: _____

BORLAND INTERNATIONAL
Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

My system is: 8 bit ___ 16 bit ___
Operating System: CP/M 80 ___
CP/M 86 ___ MS DOS ___ PC DOS ___
Computer: _____
Disk Format: _____
Please be sure model number & format are correct.
Name: _____
Address: _____
City/State/Zip: _____
Telephone: _____

California residents add 6% sales tax. Outside U.S.A. add $15.00 (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders. C-7

Don't buy a spreadsheet

A lot of electronic spreadsheets just can't cover your needs. They don't go far enough.

They're unable to work like you or adapt to the way you think.

Time for Microsoft® Multiplan,® the high energy spread. A spreadsheet with more workspace than the other leading spread. Full of high performance capabilities for your IBM® PC, PC XT, PC jr. or other MS™-DOS microcomputer.



Multiplan loves you as you are.

Other spreadsheets force you to learn how they think. Multiplan learns how you think. It remembers the way you work. Anticipates frequent commands. Even offers suggestions on spreadsheet set-up.

Commands are in English. So are formulas. Instead of typing mysterious coordinates like H54 – L73 = BK154, you can simply name worksheet areas: Sales – Costs = Profit.

that spreads too thin.

Multiplan can link information in different spreadsheets. When you make a change on one, every related one is changed.

Multiplan has optional Multiplan Application Programs that work with you to design and build custom spreadsheets for Budget Analysis, Financial Statement Analysis or Cash Planning in minutes. Not hours. Or days.

The trained mouse.

Multiplan has an optional Mouse. A handy little critter that flies through Multiplan so easily you barely have to lift a finger to select and execute commands. Small wonder Microsoft gets more performance out of a spreadsheet. We designed the MS-DOS operating system that tells the IBM PC how to think. And our BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT®
The High Performance Software

To get the best spread call 800-426-9400 (in Washington State call 206-828-8088) for the name of your nearest Microsoft dealer. Now featuring Multiplan at a reduced price: **$195.**

Suggested list price shown for Multiplan.



Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation
IBM is a registered trademark of International Business Machines Corporation

Perfect Compatibility

IBM & ACP

When you need competitive prices, prompt service and complete support, call us.

HARDWARE SPECIALS

CONTROL DATA
Full Size 320K DS/DD ..... $ 225*
"The drive IBM trusted with its logo"

TEAC
Half-Height 320K DS/DD ..... $ 195
"The #1 Rated Half-Height Drive"

AST MEAGAPLUS II w/256K .... $ 434

64K RAM Chips 200ns Pre-Tested $ 55

AST SIXPACK w/384K ..... $ 569

MAYNARD ELECTRONICS
10MB HARD DISK
(XT Lookalike) ..... $ 995

SOFTWARE SPECIALS

LOTUS 1-2-3/WORDSTAR PROPACK ..... $ 699

LOTUS 1-2-3/HERCULES GRAPHICS CARD ..... $ 679

MULTIMATE w/80K Word Speller . $ 295
An advanced word processor with all the features of a dedicated stand alone system.

dBASE II/QUICKCODE ..... $ 549

EASYWRITER II/EASYSPELLER /EASYMAILER ..... $ 195

MICROSOFT WORD w/MOUSE ..... $ 325

4-POINT GRAPHICS ..... $ 119

HARDWARE

COMPUTER SYSTEMS

IBM
PC w/256K 2 DS/DD Disk Drives ..... $ Call

TAVA
PC w/128K 2 DS/DD Disk Drives ..... $ Call
2 Parallel & 1 Serial Ports
Monochrome Monitor & Board

COMMUNICATION PRODUCTS

HAYES
Smartmodem 300 ..... $ 209
Smartmodem 1200 ..... $ 489
Smartmodem 1200B w/Smartcom II .. $ 419
Smartmodem-to-IBM 6 ft. Cable ..... $ 25
Smartcom II ..... $ 99

TAC
Irma (Emulates 3278 Terminal) ..... $ Call
Irma Line (For Remote Emulation) ... $ Call

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

FLOPPY & HARD DISK DRIVES

CONTROL DATA
Full Size 320K DS/DD ..... $ 225
Half-Height 320K DS/DD w/Bracket ... $ 195

DAVONG
5 MB to 32 MB Hard Disk Int./Ext. ... $ Call
(Includes power supply, controller & software)

TALLGRASS
12—70 MB Hard Disk w/Tape Backup .. $ Call

TEAC
Half-Height 320K DS/DD w/Bracket ... $ 195
Half-Height 640K DS/DD w/Bracket ... $ 265

MAYNARD ELECTRONICS
10MB Hard Disk WS-1 (XT Lookalike) .. $ 995
10MB Hard Disk WS-2 (XT Lookalike) .. $1195

DISKETTES

SCOTCH 3M
SS/DD Box of 10 ..... $ 30
DS/DD Box of 10 ..... $ 35

DISK CONTROLLERS

MAYNARD ELECTRONICS
Standard Disk Controller ..... $ 169
with Parallel Port ..... $ 209
with Serial Port ..... $ 229
Sandstar Modular Disk Controller .... $ 209
All Sandstar Modular Options Avail. .. $ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS
Modular Memory Board w/64K to 576K ..... $ 219
Modular Multifunction Board ..... $ 95

- **Next Day Shipping**
- **No Credit Card Surcharge**
- **Company P.O. Accepted**

We have built our reputation on offering quality products, prompt service and effective solutions. We understand your need for well-informed people who will work with you to meet your goals. Therefore we have developed a unique approach to sales. Our salespeople are well educated in the computer field and will speak with you not as salespeople, but rather as consultants. They will review your options and suggest alternatives to help you construct a system to best suit both your immediate and future needs. We also have a skilled technical staff that will guide you through any problems you may encounter after receiving your equipment.

HARDWARE CONT.

AST RESEARCH
(All AST boards include SuperDrive, SuperSpool and 1 year warranty)
SixPack Plus w/64K to 384K ..... $ 269
MegaPlus II w/64K to 512K ..... $ 269
Memory Board II w/64K to 384K ..... $ 239
I/O Plus II ..... $ 139
MegaPack w/128K or w/256K ..... $ Call
PARALLEL, SERIAL, GAME OPTIONS .. $ 35

ORCHID TECHNOLOGY
Blossom w/64K to 384K ..... $ 269

TECMAR
Captain w/64K to 384K w/Software ... $ Call

QUADRAM
Quadboard w/64K to 384K ..... $ 289

PRINTERS & PLOTTERS

C. ITOH
Starwriter Letter Quality 40 cps $1195
Printmaster Letter Quality 55 cps .... $ Call
Cut Sheet Feeder (Feeds 200 sheets) .. $ 445

EPSON
(All Printers include GRAPHTRAX-Plus)
RX-80 (120 cps, 80 cols) ..... $ Call
RX-80 F/T (120 cps, 80 cols) ..... $ Call
RX-100 F/T (100 cps, 132 cols) ..... $ Call
FX-80 F/T (160 cps, 80 cols) ..... $ Call
FX-100 F/T (160 cps, 132 cols) ..... $ Call
Epson-IBM Cable ..... $ 30

HEWLETT PACKARD
HP—7470A Two Pen Plotter ..... $ Call
HP—7475 Six Pen Plotter ..... $ Call
HP-IBM Cable (works w/Lotus 1-2-3) .. $ 50

NEC
NEC 3550 Letter Quality 35 cps $1699
NEC 2050 Letter Quality 18 cps ..... $ 950
Bi-Directional Tractor ..... $ 235
Cut Sheet Feeder (Feeds 200 Sheets) .. $ 445
NEC-IBM Cable ..... $ 30

OKIDATA
Microline 83A (120 cps, 132 cols) .... $ 575
Microline 92 (160 cps, 80 cols) ..... $ 445
Microline 93 (160 cps, 132 cols) ..... $ 749
Microline 84 (200 cps, 132 cols) ..... $ 990
Plug n' Play ..... $ Call
Okidata-IBM Cable ..... $ 30

MONITORS

AMDEK
Video 300 Green Screen ..... $ 300
Video 300A Amber Screen ..... $ 145
Video 310A IBM Monochrome in Amber ..... $ 170

PRINCETON GRAPHICS
HX-12 RGB Hi Resolution Color ..... $ 499
Max-12 IBM Monochrome in Amber .. $ Call
SR-12 Hi Resolution Color ..... $ Call

QUADRAM
Quadchrome Hi Resolution Color .... $ 519

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card ..	$ 359
PC COMPONENTS	Bi-Graphix I	$ Call
PARADISE SYSTEMS	Multidisplay	$ 399
PC+ PRODUCTS	Colorplus	$ 419
STB	Graphix Plus ...	$ 399
QUADRAM	Quadcolor I	$ 199
TECMAR	Graphics Master	$ 499

MISCELLANEOUS

FTG—Light Pen ..... $ Call

KEY TRONIC
Typewriter Keyboard (KB 5150) ..... $ Call
Deluxe Keyboard (KB 5151) ..... $ Call
KOALA—Touch Tablet w/Software .... $ Call
KRAFT—Joystick ..... $ 49
MICROSOFT—Mouse w/Software .... $ 159
MOUSE SYSTEMS—PC Mouse ..... $ Call
T.G.—Joystick ..... $ 49

SOFTWARE

ALPHA
Database Manager II ..... $ 199
Apple—IBM Connection ..... $ Call

ASHTON TATE
dBase II ..... $ 385
Friday ..... $ 179
Framework ..... $ Call

BEST PROGRAMS
PC/Professional Finance Program II .. $ 179

CENTRAL POINT SOFTWARE
Copy II PC ..... $ 35

DIGITAL RESEARCH
CPM/86 ..... $ Call
Concurrent CPM/86 ..... $ Call

FOX & GELLER
Quickcode ..... $ 169
dGraph (Requires Graphics Card) .... $ Call
dUtil (Utilities For dBase II) ..... $ Call

OZ
FINANCIER—Financier II ..... $ 119
FUNK—Sideways ..... $ 49
HAYES—Smartcom II ..... $ 99
IMSI—4 Point Graphics (Rated #1) ... $ 119

INDIVIDUAL SOFTWARE
Tutorial Set (IBM PC/XT and DOS) .... $ 49

INFORMATION UNLIMITED SOFTWARE
EasyWriter II System (See Specials) .. $ 195
Accounts Receivable ..... $ 299
Accounts Payable ..... $ 299
General Ledger ..... $ 299
Payroll ..... $ 369

INFOCOM—Zork I, II, III ..... $ 29

LATTICE
C-Compiler ..... $ 299
C-Food Smorgasboard ..... $ 110

LIFETREE
Volkswriter ..... $ 115
Volkswriter Deluxe w/TextMerge ..... $ 179

LIGHTNING SOFTWARE
Master Type (Best Typing Tutor) ..... $ 39

LOTUS DEVELOPMENT
Lotus 1-2-3 (Version 1A) ..... $ Call
Symphony ..... $ Call

MICRO DATA BASE SYSTEMS
Knowledgeman ..... $ 350

MICROSOFT
C-Compiler ..... $ 349
Flight Simulator ..... $ 35
Multiplan (New Version) ..... $ 149
Multi-Tool Word ..... $ 275
Multi-Tool Word w/Mouse ..... $ 325
Pascal Compiler ..... $ 250

MICROPRO
Wordstar w/Tutorial on Disk ..... $ 259
Wordstar/MailMerge/CorrectStar/ StarIndex (ProPack) ..... $ 369

MICRORIM
R.base 4000 ..... $ 299
Clout ..... $ Call

MICROSTUF
Crosstalk XVI (for Hayes Smartmodem) ..... $ 109

MORGAN COMPUTING
Trace 86 (Assembly Language Debug) $ 99
Ted (Program Editor) ..... $ 79

PETER NORTON
Norton Utilities ..... $ 55

ROSESOFT
Prokey (Newest Version) ..... $ 95

SOFTWARE ARTS
TK!Solver ..... $ 299

SOFTWARE PRODUCTS
Open Access ..... $ 399

SATELLITE SOFTWARE INTERNATIONAL
Word Perfect (includes Speller) ..... $ 299
P. Edit (Program Editor) ..... $ 95

SOFTWARE PUBLISHING
PFS/File ..... $ 95
PFS/Graph ..... $ 95
PFS/Write ..... $ 95
PFS/Report ..... $ 79

SOFTWORD SYSTEMS
Multimate (See Specials) ..... $ 295

WANG PUBLICATION
Random House Proof Reader 50K speller ..... $ 45

APPLIED COMPUTER PRODUCTS INC.
1916 Welsh Road #6, **Philadelphia, PA** 19115
215-934-6990
1-800-223-3860
CIRCLE 121 ON READER SERVICE CARD

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds. • We do not charge your card until we ship. • **No surcharge added on VISA and Mastercard** • Allow one week for personal and company checks to clear • COD maximum $500 Cash or Certified check on delivery • Please use local phone number for order status inquiries. • Prices subject to change without notice. • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add $4. **Most orders shipped next day.**

ASAP Databases Allow Access to Article Texts

BY DARA PEARLMAN

BELMONT, Calif.—If you needed an article from *Women's Wear Daily* or *Scientific American*, would you be willing to pay $13 to $15 to see it scroll by on your computer screen? Information Access Company (IAC) of Belmont, California, is betting that you might.

Its two new on-line databases—Magazine ASAP and Trade and Industry ASAP—offer on-line access to the full texts of articles from 143 magazines and trade publications. (IAC is owned by Ziff-Davis, which publishes *PC Magazine*.)

Magazine ASAP features 56 magazines, including *Business America, Car and Driver, Changing Times, Creative Computing, PC*, and *Yachting*. Trade and Industry ASAP covers 87 publications, including *Advertising Age, American Banker, Billboard, Datamation, Graphic Arts Monthly, Implement & Tractor, PR Newswire*, and *Ward's Auto World*.

You can use the ASAP databases if you subscribe to Dialog Information Services. Coverage begins with the January 1983 issues of the magazines and will be cumulative.

Search Techniques

While not the first on-line collection of magazine articles, ASAP claims to be the first to offer "controlled vocabulary searching," an on-line search technique that allows you to request articles that fit into predetermined Library of Congress categories. For instance, if you wanted to see the latest news on IBM's corporate acquisitions, you could ask to see articles indexed by "IBM" and "merger." In all of the articles retrieved, IBM and mergers would be main topics.

ASAP databases also permit "free text searching." The database software retrieves all articles that use the words *IBM* and *merger*, which might include articles of no interest whatsoever.

According to Dolores Portugal, product manager for on-line products at IAC, the free text search can be useful if you need information on a topic that doesn't fit into a Library of Congress category. For example, if you wanted to know about "golden parachutes," a popular escape clause in employment contracts for top corporate executives, you'd use a free text search for the term *golden parachute*, because there is no Library of Congress category to describe that concept.

Dialog Know-how

To use the ASAP databases, you must know how to communicate with Dialog. You also need a pretty hefty budget for on-line information. Dialog passes along the bill from the data communication network of your choice (Telenet, Tymnet, or Uninet), which will range between $6 and $8 per hour. In addition, you pay $84 per hour while you're connected to the ASAP database.

How Much?

Portugal estimates that each article viewed on-line will cost between $13 and $15. Although that's not competitive with the newsstand, it might be cheaper than ordering an article through an information broker, she adds. If you don't mind waiting, you can cut some costs by telling Dialog to print the article off-line and send it to you by mail. This method will cost between $8 and $9 per article.

Search Helper

For the cost-conscious on-line searcher, IAC has another new product that simplifies the task of on-line searching.

The product is a software package called *Search Helper* that allows someone to retrieve information from six IAC databases offered through Dialog. The databases are Magazine Index, National Newspaper Index, Trade and Industry Index, Legal Resource Index, Newsearch, and Management Contents.

Using a series of menus, the program asks you questions about the information you want to find and then takes care of all of the mechanics for you.

At Carnegie Mellon University in Pittsburgh, Pennsylvania, undergraduates with no prior training have been able to use *Search Helper*, according to Thomas Michalak, director of University Libraries.

Search Helper works only with IAC databases because IAC is selling access to its databases together with the program. When you purchase a "software subscription" to *Search Helper* for a $200 annual fee (which includes upgrades and customer service), you also have to buy at least one "search packet subscription" of 700 on-line searches for $1,950. While the packet price might be intimidating at first, some quick arithmetic reveals that you're paying only $2.50 per search, quite a bargain in the high-priced world of on-line databases.

Has Its Limits

Still, *Search Helper* cannot completely replace the expertise of a top-notch searcher. *Search Helper* can only create searches using the Boolean AND operator; it doesn't know how to use OR or NOT. *Search Helper* will only retrieve 20 citations at a time, although it will retrieve the next 20 in a subsequent search. And while *Search Helper* lets you peruse the results of your search off-line and will print selected citations, it won't let you save them in a disk file for later use. Each new search erases the results of the previous search. Niemeier contends that even with these limitations, *Search Helper* can handle up to 80 percent of a library's on-line searches.

For more information contact Information Access Company, 11 Davis Drive, Belmont, CA 94002, (800) 227-8431. ■

The Spirit Continues



WASHINGTON — Stewart Brand of the *Whole Earth Software Catalog* is in good company. Cris Popenoe, the author of another counter-cultural compendium of the 1970s, also survived into the 1980s and, like Brand, is now cultivating computer data.

Originally published in 1976, her *Inner Development* was a 654-page guide to 11,000 spiritual books and records. Catalog-author Popenoe didn't merely list every title ever published about Astrology, Buddhism, Christianity, Divination, Fairy Tales, Gurdjieff, Humanistic Psychology, and so forth; she wrote introductions to each subject and revealing capsule reviews for nearly every book.

In the *Whole Earth Catalog*, Stewart Brand praised *Inner Development*, calling it "a *Whole Earth Catalog* (we don't say this very often) of spiritual books."

Today in Washington, D.C., Popenoe manages the Yes! Bookshop, and has seeded its shelves of spiritual works with a new breed of books—computer tomes. Popenoe leads readers into this different field with another catalog, *Book Bytes*, which lists and organizes over 1,200 computer titles—including over 100 specifically about the IBM PC. Continuing the tradition of her *Inner Development*, Popenoe has written reviews of each book and flags those that give the best introduction to each subject.

Cris Popenoe's *Book Bytes*, published by Pantheon Books of New York, is priced at $9.95. ■

INTRODUCING THE THREE SMARTEST TOOLS EVER CREATED FOR THE BUSINESS MIND.

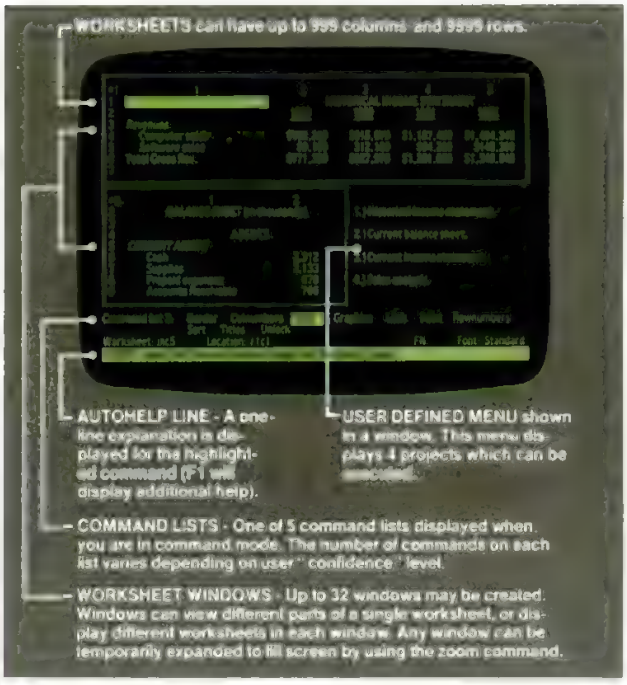
Copyrighted material

THE SMART SPREADSHEET WITH GRAPHICS.

The name of the game in spreadsheets is power. The Smart Spreadsheet with Graphics offers unmatched power and pictures, in one convenient package.

A truly remarkable feature of this smart software is how it "thinks" about using space. It's based on the "waste not, want not" principle.

For example, when a user places a number in row 50, column 10 of any other spreadsheet program, 500 cells worth of memory are immediately allocated—even if no value is entered anywhere else in row 50 or column 10. Consequently, 499 cells of usable memory are "tied-up" unnecessarily.





The Smart Spreadsheet will never let this happen. Its unique "sparse matrix" data structure would have only allocated one cell worth of memory.

This "space-saving" approach benefits all spreadsheet users. The Smart Spreadsheet puts at their fingertips four to ten times more usable memory. It's the only spreadsheet that can boast the capacity for up to 999 columns by 9999 rows.

In addition to its frugal approach to memory allocation, business users will find The Smart Spreadsheet offers powerful math and decision-making functions. It is extremely flexible. It will handle huge amounts of data, in many formats, while performing an unprecedented combination of business tasks.

To make sure the process doesn't become overwhelming (nobody's memory is that good), up to 32 windows can be opened to review worksheet sections or sections of other worksheets.

When it comes to graphics, few programs can compare to the full-color, full-featured package offered by The Smart Spreadsheet, which gives users a wide variety of visually appealing options.

Graphics can be enhanced by multiple type styles on-screen and on printed or plotted output. Graphics options include: 1-, 2-, and 3-D bar charts; high-low charts; pie and cake charts; line, point, and scatter graphs; and histograms.

And just to keep things interesting, there's even a built-in slide show. Business users can show their business bosses some of their favorite pie-cake-bar-point-high-low graphs in a crisp, informative presentation, in any order, any combination, any time.

Even with its unprecedented data capacity, math functions and graphics capabilities, The Smart Spreadsheet with Graphics is still the easiest-to-use forecasting tool a business can own.

Of course this wouldn't be smart software if it didn't make life easier with features like multiple help and menu levels, total integration with other smart software, and the knack for remembering how to repeat a complex project.

GENERAL	999 columns X 9999 rows
	Up to 80 characters/cell (values and text)
	Up to 1920 characters/cell (formulas)
	Sparse matrix data storage
	Relational spreadsheets
SPECIAL FEATURES	Information management in spreadsheet form
	Multiple spreadsheets in memory at once
	Extensive calculation and decision-making; math, trig, statistical, date/time and decision (if-then-else, etc.) functions
	Project processing through command files
	Three user "confidence" levels
GRAPHICS	Supports full color
	1-, 2-, 3-D bar charts
	Pie and cake charts
	High-low charts, histograms
	Line, point and scatter graphs
	Merge graphs with text into word processing documents
	Edit graph capabilities before printing or plotting
	State-of-the-art printing and plotting
	Built-in "Slide Show" presentations

THE SMART DATA MANAGER.

All businesses have three things in common. They all accumulate more data than they realize. They can never seem to find it when they need it. And if they could find it, they probably couldn't make much out of it.

The Smart Data Manager is the most intelligent data base available to the micro user.

From these observations, the data processing industry was born. But access to DP capabilities was limited.

Now The Smart Data Manager puts the benefits of data processing into the hands of business decision makers, providing them with an extremely efficient and versatile management tool.

Here, for the first time, is a relational data manager that can be operated by its own menus, user-defined menus, or built-in "common-sense" commands. Users can concentrate on what to ask rather than how to ask for information.

Because of its three "confidence" levels, users can start with the basics and work their way up with the peace of mind that they won't be inundated with menu options—until they're ready. They're also assured that HELP is always at hand.

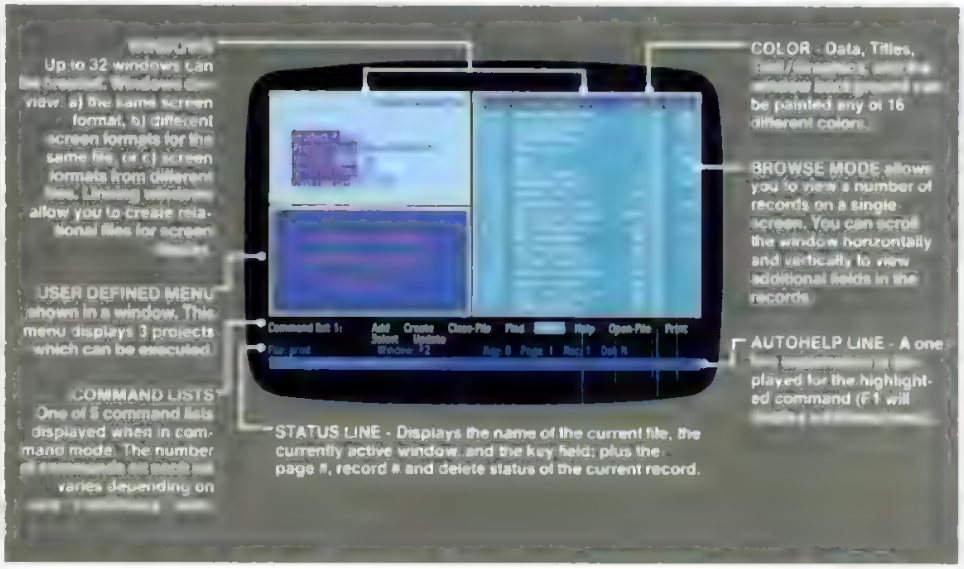
Naturally, The Smart Data Manager does a masterful job of filing, organizing, locating, interrelating, and retrieving all sorts of facts and figures, names and addresses. And it will remember exactly how to repeat all tasks for any repeated project.

Lists, reports, and forms can be generated with unlimited versatility and in a variety of type styles and sizes. Users can give that "smart" look to even the most perfunctory business paperwork.

Put to work with The Smart Word Processor and The Smart Spreadsheet with Graphics, The Smart Data Manager becomes the cornerstone for the most powerful, most versatile, and most innovative information management system ever created.



GENERAL	1000 characters/field
	4000 characters/record
	255 fields/record
	100,000 records/file
	Up to 15 key fields maintained
	Efficient B-tree organization
SPECIAL FEATURES	Up to 10 "screen views"/file with up to 15 pages each
	Security password entry at both screen and file levels
	Eight field types
	Character and numerical range verification
	Multiple criteria selects
	Prepared menus, custom-defined menus or command language
	Extensive calculation and decision-making capabilites
	Project processing through command files
	Three user "confidence" levels
RELATIONAL CAPABILITIES	Multiple file interaction
	Look-up data gathering
	Transaction data passing



MORE SMART FEATURES

The Smart Data Manager does more than handle standard data base applications It also has powerful field calculating abilities which help minimize data entry.

In addition, "if-then-else" logic can be applied to any field. And the report generator can print standard reports from any file, in any order. Or, users can output data to match pre-printed forms, labels, invoices, etc.

With these features, The Smart Data Manager solves virtually any data gathering problem, no matter how detailed or complex.

SMART SOFTWARE FROM INNOVATIVE SOFTWARE™

Until now, software has been designed to be powerful, versatile, and hard working. Unfortunately, this has usually meant hard work for the business user.

Despite technological feats, business software has not been known for meeting many human requirements.

Now with unmatched simplicity, smart software links the business user with the business system. It creates, for the first time, an environment that differentiates working hard from working smart.

Like a bright and resourceful assistant, smart software lets the user create, change, and duplicate tasks without constant supervision. It's eager to do the work. But always ready to learn more.

No longer is the user constrained by "unnatural" information flow, or a slave to reformatting data or commands. Nor is the user confronted with overwhelming study prerequisites before putting software to work.

Smart software is available in three applications: The Smart Word Processor, The Smart Spreadsheet with Graphics and The Smart Data Manager. Together, they provide an unlimited "applications bank." But each works powerfully by itself.

Smart software creates new meanings for "state-of-the-art," "integration," "user-friendly," and "full-featured." It sets new standards by which all other business software should be measured.

SMART SOFTWARE AT A GLANCE

GENERAL	Up to 32 windows/program
	Multiple files, documents, or spreadsheets in memory at once
	Supports mouse
	Supports full color
	Supports most popular printers and plotters
INTEGRATION	True integration - packages directly share information from each other and pass information automatically
SPECIAL FEATURES	Automatic project processing-remembers commands (not a macro)
	Three user "confidence" levels
	Prepared menus, custom-defined menus, or command language
	Multiple typestyles on-screen and in output
	Built-in time manager/appointment scheduler
	Built-in business/scientific calculator
	Extensive calculation and decision-making capabilities
	Keyboard macros
	Supports 8087 floating point processor chip
HARDWARE	IBM PC®, XT, COMPAQ™ or compatibles
	128K RAM, two double-sided disks or a hard disk

These unique features are standard for all smart software products. Each program also offers many exclusive application-specific features.

A BUSINESS TASK MASTER

Successful businesses operate by performing tasks and projects well. Most of their information demands involve repetitive projects and tasks.

Now, with a single keystroke, multi-faceted information projects can be repeated—start to finish—without repeating commands.

Think of it as "project processing." Smart software makes it a reality for microcomputers. It lets the software "learn" the user's chain of commands and repeat them, time after time, with a single prompt.

Using a unique "remember" mode, commands are recorded automatically.

Unlike a "macro" capability (which only remembers keystrokes), smart software has the "intelligence" to remember commands. It's the difference between remembering the letters in a word and knowing how to use the word.

INTEGRATION CUM LAUDE

Smart software integrates the user with the information system. It also integrates the programs—lets them "talk" to one another.

Smart software has the ability to pass information effortlessly between programs, and to store and retrieve information. The software (not the user) does the work of transferring data and translating instructions. Smart software lets the user concentrate on the task at hand rather than on how to make different programs work together.

THE STUDENT TEACHER

Despite its "learning" abilities, smart software has the patience to teach—in the school of "hands-on" experience. So even first time users can begin working immediately, and learn as they do.

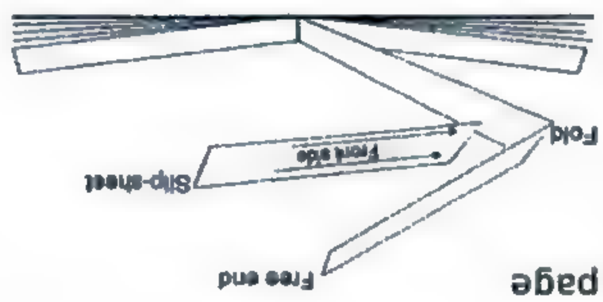
Each program is structured into three ascending tiers of user "confidence." HELP is available at each level. No matter what's on the screen, one command presents detailed instructions.

HELP and menu information are consistent with the confidence level being used. Beginners work without confronting complex instructions and options. More advanced users can enter at any level they choose, and backtrack if they bite off too much.

But regardless of the "confidence" level, the user is continuously supported by full integration and project processing.

Inverted Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

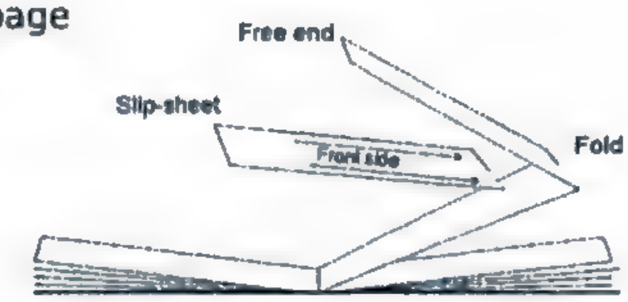


Folded edge of the page

GbsSlipSheet-001

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



Inverted Back

1. Follow instructions on the other side

GbsSlipBack-001B

Back

1. Follow instructions on the other side

THE SMART WORD PROCESSOR.

GENERAL	Automatic "Flying Reform"
	"Cut and Paste" in or between documents
	Supports mouse
	Document size limited only by disk space
	Footnoting capabilities
	On-screen math capabilities
SPECIAL FEATURES	Multiple type styles on-screen and in output
	STET-second thought editing (undo)
	On-screen page breaks
	Project processing through command files
	Three user "confidence" levels



The Smart Word Processor (with the help of a quality printer), will deliver the same professional-looking and graphically appealing documents associated with dedicated word processing systems. But that's where the similarity ends.

Most businesses aren't in the business of word processing. So their word processing needs are very special. What they need is an extremely versatile writing, editing, and composing tool.

Not only that, they need a tool that can be used without long hours of special training or pages of highly technical instructions.

The Smart Word Processor is all those things and much more. It offers users a variety of type styles and sizes, as well as features like boldface, italics, small caps, underline, sub-script, super-script, even Gothic and Greek. Choices that meet the demands of the most fastidious, style-conscious writer.

The Smart Word Processor is the most versatile writing, editing, and composing tool ever designed for the business mind and the micro-computer.

Because bold is **bold**, italic is *italic*, and so on, the user can see the text on the screen exactly the way it will look on paper. This constant visual feedback lets the user write with just the right emphasis.

To help the train of thought, The Smart Word Processor's multiple windows allow many parts of a document (or parts from many documents) to be referenced simultaneously as text is being written.

Good writing demands good editing. Changing words, rearranging paragraphs, copying between (or within) documents—even footnoting—are the stock and trade of The Smart Word Processor. It even includes a "stet" feature for undeleting (to correct editing mistakes).

And as text is added, deleted, or moved about, the "flying reform" feature makes sure that everything is reformatted, automatically.

Depending on the "confidence" level (there are three), menu options will address only the level being used. Of course, HELP can be called at any time, at any level.

The project processing feature makes organizing complex business reports a snap. Either with its own text files, or with other smart software, this word processor will remember how it's been told to prepare a document—and do it again at the touch of a key.

Because it's fully integrated, The Smart Word Processor doesn't have a problem dealing with "foreign" data, such as graphics or data files. So any information can be effortlessly retrieved from either The Smart Data Manager or The Smart Spreadsheet with Graphics (or both). Once retrieved, anything and everything can be merged with the text being processed.

For example, when used with The Smart Data Manager, the business manager can retrieve historical data to generate informative reports.

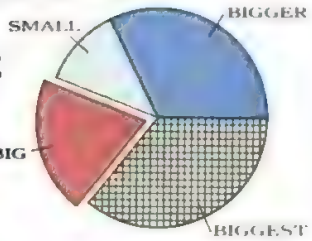
Then selected information can be summarized and used by The Smart Spreadsheet with Graphics to forecast future activity.

Finally, charts and graphs (from both historical and projected data) can be easily included in the document being prepared, either as stand alone items or surrounded by document text.

Just to round things out, The Smart Word Processor also includes a handy, on-screen calculator and a time manager/appointment scheduler. Business math calculations can be performed at any time, in a window on-screen, and inserted at any place in the document being processed. Appointments can be set, checked, re-checked, changed with the stroke of a key.

With the Smart Word Processor, what you see on the screen is what you get on paper.

You can make bold statements; *give a unique slant to your writing;* underline for emphasis; super-SCRIPT for mathematical equations ($E=mc^2$); sub-SCRIPT for footnoting$_1$; use ALL CAPS or SMALL CAPS.



You can even wrap text around graphs for a picture-perfect look.

PERFORATED FOR EASY REMOVAL.

THE SMART BUSINESS DECISION.

There are countless numbers of software products available today to meet the spectrum of business applications. But nothing compares with the way smart software meets the needs of the business user.

Together, The Smart Word Processor, The Smart Spreadsheet with Graphics, and The Smart Data Manager accommodate virtually every business application. And, for the first time, these needs are met in a "business environment" rather than a "data processing" environment.

Here is software designed so that the user can concentrate more on the business at hand and less on the microcomputer system. Here is software that links the business user with the speed and efficiency of the business computer—without "computer literacy" prerequisites.

With unmatched simplicity, smart software rivals the power and features of all other leading software packages. It also rivals the after-purchase support offered by all others.

Here are a few more reasons why smart software is the smartest choice in business software.

FREE VIDEO LEARNING CASSETTES
Purchasers of any smart software program can request a video tape learning cassette, absolutely free.

Available in both VHS and BETA formats, these cassettes highlight many operational points and special application features. Each video cassette covers the complete smart software series. With the aid of sight and sound, users can work along with video lessons.

It's also a great way for the purchaser of a single smart software product to preview other smart software.

Cassettes are ordered when the product registration card is completed and returned. Learning cassettes are free to smart software owners, or can be borrowed from participating smart software dealers.

USER HOTLINE SUPPORT
Registered smart software owners also qualify for a toll-free telephone assistance service. Between regular business hours (central standard time), users can consult with customer assistance representatives, should the need ever arise.

FREE TUTORIAL DISKS
Each smart software product includes a useful tutorial disk to guide users, step-by-step, through on-screen examples of special features.

Tutorials make it easy for even first-time users to start working smarter, faster.

And they're free.

$200 CASH-BACK OFFER
Purchasers of more than one smart software product are eligible to receive up to $200 in cash refunds from Innovative Software, Inc.

This offer makes purchasing the family of smart software even more affordable.

Cash-back coupons are packed with each product along with complete redemption instructions.

FREE PRODUCT UPDATES
Innovative Software, like most software manufacturers, periodically releases new versions of certain software products, incorporating new or improved features.

Unlike other software manufacturers, Innovative Software will supply updates to registered smart software owners, free of charge, for one year.

PRODUCT REPLACEMENT
Innovative Software also offers a Product Replacement Plan which goes into effect after the original 90-day product warranty period.

The Product Replacement Plan allows for replacement, at a nominal charge, of the original program diskettes, should they become damaged through normal use.

THE SMART CONCLUSION.

There has never been a software offering to match the scope and simplicity of smart software. Everything about the software and the way it is supported has been created with the business user in mind.

Project processing allows it to perform repetitive tasks without constant supervision.

Integration allows each of the smart programs to work in harmony with one another, giving the user virtually unlimited application opportunities.

And three "confidence" levels assure fast start-up and worry-free operation.

Given these unique features, smart software is, without doubt, the ultimate information management system. It sets new standards by which all other business software will be measured.

Call a local computer dealer today for a free demonstration.



CALL TOLL FREE
800-GET-SMART
FOR THE NAME OF THE SMART SOFTWARE DEALER NEAREST YOU.

INNOVATIVE™ Software

9300 W. 110th ST., SUITE 380, OVERLAND PARK, KS 66210 USA
IN KANSAS CALL 913-383-1089

IBM PC and XT are trademarks of the International Business Machines Corporation
COMPAQ is a trademark of COMPAQ Computer Corporation

Product features subject to change without notice. Printed in U.S.A. ● 1984, Innovative Software, Inc.



If You Don't Find the Kind of Software You Need on a Vanpak Center, They Don't Make it Yet.

Shopping for IBM PC, PC/XT, PCjr programs is easy when a variety of every possible software category is right in front of you. The Vanpak PC Software Center offers you a chance to try over 650 software programs "hands-on" the IBM PC. Or, plug in a videotape and see the original author talk about a program and how it is used.

The Vanpak library of software includes programs in business, database, education, engineering, entertainment, finance, investment, office management, statistical analysis, and word processing.

Vanpak software is completely supported by your dealer. Contact your Vanpak dealer NOW for a demonstration on any Vanpak program.

Softwareland
2815 North Central
Phoenix, AZ 85004

Personal Computer Place
1840 North Southern
Mesa, AZ 85202

Softwareland
1150 West Southern
Mesa, AZ 85202

Softwareland
2515 North Scottsdale Road
Scottsdale, AZ 85257

Softwareland
4041 North Oracle
Tucson, AZ 85705

Software Supermarket
11960 Wilshire Blvd.
Los Angeles, CA 90025

Computer Management Center
5800 Eastern Avenue, Suite 270
City of Commerce, CA 90040

Jade Computers
4901 West Rosecrans
Hawthorne, CA 90250

Compusales
16819 Hawthorne Blvd.
Lawndale, CA 90260

Strictly Software
14615 S. Prairie Avenue
Lawndale, CA 90260

Informat Computer Center
22811 Hawthorne Blvd.
Torrance, CA 90505

Computer Palace
1029 East Broadway
Glendale, CA 91205

The Computer-Line, Inc.
21054 Sherman Way
Canoga Park, CA 91303

Personal Computers, Etc.
6911 Topanga Canyon #103
Canoga Park, CA 91301

Idea Systems, Inc.
21016 Devonshire Street
Chatsworth, CA 91311

Marsh Manufacturing
18544 Parthenia Street
Northridge, CA 91324

Compucad Systems, Inc.
19447 Ventura Blvd.
Tarzana, CA 91356

Serviceland
18348 Ventura Blvd.
Tarzana, CA 91356

Computer Stop
3637 Thousand Oaks Blvd.
Westlake, CA 91361

Informat Computer Center
20929 Ventura Blvd.
Woodland Hills, CA 91364

Software Supermarket
15113 Ventura Blvd.
Sherman Oaks, CA 91403

Data Center
14900 Ventura Blvd.
Sherman Oaks, CA 91403

Softsery, Inc.
1047 W. Foothill Road
Upland, CA 91786

Image Computers
425 E. 2 Sante Fe
Encinitas, CA 92024

Mostly Software
3333 Midway Drive
San Diego, CA 92110

Softwareland
4620 Convoy Street
San Diego, CA 92111

Computer World
5375 Kearny Villa Road
San Diego, CA 92123

Associated Business Computers
12210 Michigan Avenue #D
Grand Terrace, CA 92324

Computer Stop
28181 Marguerite Parkway
Mission Viejo, CA 92692

Serviceland
2610 South Bristol
Santa Ana, CA 92704

Super Computer
1101 South Grand, Suite J
Santa Ana, CA 92705

The Computer-Line, Inc.
17791 Fitch Street
Irvine, CA 92714

Serviceland
1269 W. El Camino Real
Sunnyvale, CA 94086

Need to Know
279 Ninth Street
San Francisco, CA 94103

Apex Information Systems
2517 Van Ness Avenue
San Francisco, CA 94109

Hunter Research
6801 Dublin Blvd.
Dublin, CA 94568

Executive Computer
923 San Pablo Avenue
Albany, CA 94706

Computer Warehouse
6024 Fair Oaks Blvd.
Carmichael, CA 95608

The Computer-Line, Inc.
1136 South Colorado Blvd.
Denver, CO 80222

Budget Computer Systems
5111 Southwest 8th Street
Miami, FL 33134

Computer Center of Boca Raton
2200 Glades Road, Suite 602
Boca Raton, FL 33432

TLC Computer Centers
2569 Country Side Blvd., Suite I
Clearwater, FL 33519

Business Information Systems
3145 Peachtree Road N.E.
Atlanta, GA 30305

Strictly Software
2334 South King
Honolulu, HA 96826

Amtec Computer Systems
8515 Douglas, Suite 17
Des Moines, IA 50322

Rocky Mountain Computing
6094 Emerald
Boise, ID 83704

Computers-N-Stuff
25779 Route 45
Mundelein, IL 60060

Statewide Teaching Aids
301 C McArthur Drive
Alexandria, LA 71306

Modular Data Systems
184 Jones Road
Falmouth, MA 02540

Custom Computer Shop
5502 Kenilworth Avenue
Riverdale, MD 20737

Software City
206 South Fifth Avenue
Ann Arbor, MI 48104

Video Tech Software
1377 E. Grand River Blvd.
East Lansing, MI 48823

Boffin, LTD
10800 Normandale Blvd.
Bloomington, MN 55437

Serviceland
334 South College Road
Wilmington, NC 28403

Red River Computers
4325 13th Avenue South
Fargo, ND 58103

Alpha Business Computers
26 North Main
Minot, ND 58701

CCSA of America, Inc.
100 South Highway 73
Kresson, NJ 08043

Computer Professionals
Greentree & Fellowship Roads
Sewell, NJ 08080

The Software Shop
The Techniplex
East Rochester, NY 14445

Cincinnati Computer Store
1171 Princeton Pike
Cincinnati, OH 45246

Computerlines
1134 Southwest Fifth Avenue
Portland, OR 97204

Software Galeria
700 West Lancaster Avenue
Wayne, PA 19087

Serviceland
4950 Belt Line Road
Dallas, TX 75240

Software Systems
3639 Brambleton Avenue S.W.
Roanoke, VA 24018

Percomp Sales
13333 Bellevue-Redmond Road
Bellevue, WA 98005

Magnapro
20101 44th Avenue W. #A3
Lynnwood, WA 98036

Olympus Computers
1516 Eleventh Avenue
Seattle, WA 98122

Alpha Computer Systems
1609 West Kennewick Avenue
Kennewick, WA 99336

Take A Byte, Inc.
813 West Columbia Drive
Kennewick, WA 99336

Alpha Computer Center
1341D George Washington Way
Richland, WA 99352

B.E.S.T., Ltd.
212 Huntcroft Road N.E.
Calgary, Alberta

Software Strategies
7412 Washington Ave. So.
Eden Prairie, MN 55344
1-800-328-7847
(in Minnesota 612-941-4044)

Only from LOGIC Unlimited . . .

Everything you need to start computing in one integrated system at a very special price!

All Hardware, Cables, Software and Documentation

Complete



- **SANYO MBC 555 COMPUTER**
  8088 CPU, 128K, Dual Disk, MS-DOS
- **SOFTWARE**

WordStar	InfoStar
SpellStar	Easy Writer I
MailMerge	Color Graphics
CalcStar	BASIC

- **MONITOR**
  Taxan HiRes Green
- **PRINTER**
  Okidata ML 82A

You'll be up and running in no time with everything you need for word processing, spread sheeting, mailing lists, generating reports and so much more . . .

$1495.00

Computers

EAGLE:
- Spirit 2 . . . . . $2450
  256K, SuperCalc³, Carrying Bag.
- Spirit XL 3875
  256K, SuperCalc³, Easy Writer 1, & Carrying Bag.
- PC Plus . . . . . CALL
- 1600 Series . . . . . CALL

COLUMBIA:
- All Models . . . . . CALL

TAVA:
- PC . . . . . CALL

TOSHIBA:
- T-100 . . . . . CALL

ALTOS/TELEVIDEO:
- All Models . . . . . CALL

Modems

HAYES:
- 1200 . . . . . $469
- 1200B 449
- 300 205

Monitors

TAXAN:
- HiRes Green . . . . . $ 97
- HiRes Amber 107
- RGB 210 299
- RGB III 399
- RGB 420 (IBM) 425

Monitors cont'd

- TTL/Green (IBM) 145
- TTL/Amber (IBM) 150

Printers

OKIDATA:
- ML 82A $299
- ML 92 419
- ML 93 689
- ML 84 949
- 2350/2410 . . . . . CALL

SPECIAL OKIDATA SALE!

STAR MICRONICS:
- Gemini 10X $269
- Gemini 15X 389
- Delta 10 399
- Delta 15 529
- Radix 10 649
- Radix 15 749

TOSHIBA:
- 1350/1351 . . . . . $1495
- 1340 777

SILVER REED:
- EXP 500 . . . . . $399
- EXP 550 499
- EXP 770 875

NEC:
- 3510 . . . . . CALL
- 3550 . . . . . CALL
- 2010 . . . . . CALL
- 2050 . . . . . CALL

IBM Accessories

AST RESEARCH:
- Six Pak Plus $269
- Mega Plus 269
- Combo Plus 269
- PC Net 269

HERCULES:
- Graphics Card $355

QUADRAM:
- Quadboard 64K $279

STB:
- All Products . . . . . CALL

KOALA TECHNOLOGIES:
- Koala Pad (IBM) $89

RAM CHIPS:
- 64K, Set of 9 . . . . . $59

Miscellaneous

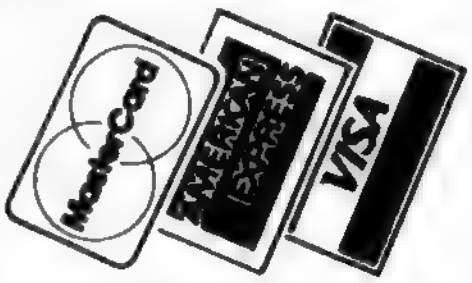
CABLES:
- IBM Parallel $22
- Standard Parallel 25

DISKETTES:
- 3M SS/DD/5¼ $21
- 3M DS/DD/5¼ 28
- BASF SS/DD/5¼ 19
- BASF DS/DD/5¼ 26

INNOVATIVE CONCEPTS:
- Flip N File 50 . . . . . $19

To Order

- **Pricing Policy:** Advertised prices reflect cash discount. Certified check or money order please. Company or personal checks allow two weeks for check to clear. Prices subject to change without notice.
- **COD Orders:** We will accept COD orders for up to $500. COD orders please add 2% to advertised prices.
- **Credit Card Orders:** We accept VISA, MasterCard, and American Express. Credit card orders please add 3% to advertised prices.
- **Sales Tax:** Ohio residents add 5½% state sales tax.
- **Purchase Orders:** We will accept PO's from major Universities and Fortune 1000 companies. Terms net 30 days.
- **Shipping & Handling:** Please add 2% to total of all orders for shipping & handling. ($2.50 minimum)



USE YOUR CREDIT CARD!

TOLL-FREE ORDER LINE:

800/321-7492

IN OHIO CALL 216/746-0620

LOGIC Unlimited

1323 Florencedale Avenue Youngstown, Ohio 44505 Technical Assistance/Order Status 216/746-0620

CIRCLE 130 ON READER SERVICE CARD

We offer one of the largest **selections** in the business—peripherals, software, accessories and supplies.
We support everything we sell.
Large orders need special attention: ask for a **Corporate Account Representative.**
No extra charge for credit cards: Visa, MasterCard & American Express.
Shipping is cost plus $1.50.
We're proud of our PC expertise.

micro STOREHOUSE

333 Peters Street, S.W./Atlanta, Georgia 30313/404-577-8892

DATABASES
Ashton Tate Friday $179
dBase II $395
PowerBase . . . . . call
IUS EasyFiler $250
Micro Data Base Systems
Knowledgeman . . . . . call
Microrim R:Base . . . . . call
MicroPro InfoStar. $275

WORD PROCESSING
Aspen Random House Dictionary. . . $45
MicroPro
Wordstar professional pack $360
WordStar 3.3 . . . . . $260
Microsoft
Word w/Mouse $310
w/out Mouse $279
Multimate $295
MultiMerge. Converts database files to Multimate Merge files $75
SSI Personal Word Perfect $145
WordPerfect $325
Oasis Punctuation and Style $105
Correct Star. . . . . call
IUS EasyWriter II System $210

COMMUNICATIONS
Hayes Smartcom II $89
MicroStuf Crosstalk XVI. $109

BUSINESS PACKAGES:
IUS (most packages) $305
Informs . . . . . call
Dow Jones . . . . . call
XQ. . . . . call

PROGRAMMING
Microsoft
C compiler. $335
FORTRAN $410
Business BASIC $410
COBOL $485
Pascal $300
Lattice C. Compiler $335

PROGRAMMING AIDS
Peeks and Pokes $25
The Inside Track $30
Screen Utilities for compiled languages $75

GRAPHICS
PCDraw . . . . . call

TRAINING PACKAGES
ATI (various) $45
Systems Makers New Advanced tutorial on Lotus 1-2-3 . . . . . $169

FOR FUN
Infocom
Starcross $27
Deadline $35
Suspended 35
Microsoft Flight Simulator $37
Spinnaker . . . . . call

UTILITIES
Norton's Utilities $55
Prokey $95

PRINTER PROGRAMS
Snapshot. A phenomenal new graphics dump program that runs on a variety of computers and supports dozens of printers $60
Set FX. To make your Epson printers more versatile $45
Sideways $45

DISKETTES
Verbatim
single sided, soft sectored $24
double sided, soft sectored $34
Dysan . . . . . call

INTEGRATED SOFTWARE
Open Access $445
Dayflo . . . . . call
VisiOn . . . . . call

STORAGE
Flip N' Files. $25
Diskbanks, set of 5 . . . . . $30

DISK DRIVE ANALYZERS
Verbatim $27

EXTRA MEMORY
64 K ram chip kit. $55

DISK DRIVES
Tandon double sided disk drives. . $225
Amdek half heights. . . . . call
Quadram Quaddisk, hard disk drives. . . . . call
Pegasus hard disk drives . . . . . call
Pegasus Fantastic quality hard disk drives at unbelievable prices . . . . . from $1275

AST Communications Products . . . . call
Sixpack plus . . . . . from $265
I/O plus . . . . . from $125
Tecmar Graphics Master $485
Quadram
New 384 K quadboard . . . from $245
MicroFazers . . . . . call
Quadlink $475
Quadcolor I $210
Quadcolor II $235
Hercules $350

SURGE PROTECTORS
NetWorx Surge Protection Device. . . . $55

MODEMS
Hayes 300 . . . . . $199
Hayes 1200 . . . . . $485
Novation Access 1-2-3 . . . . . $425
Hayes 1200B $450

MONITORS
Amdek Monitors
300 G. $130
300 A. $140
310 A. $160
New! Amdek Color IV $605
Quadram Quadchrome $485
Zenith Z133 Color monitor. Call and ask about the specs on this superb monitor, possibly the best on the market $499

PRINTERS
Canon Ink Jet Printer. We sell this phenomenal new printer with a graphics screen dump program, our exclusive: $725
Datasouth 180 . . . . . $1375
Datasouth 220 . . . . . call
Epson
RX80 . . . . . call
RX80 FT . . . . . call
FX80 . . . . . call
FX100 . . . . . call
Star Micronics
Gemini 10X $285
Delta 10X . . . . . call
Gemini 15X . . . . . call
Okidata
92 . . . . . call
93 . . . . . call
84 . . . . . call
Diablo 630 letter quality. $1675
CRII $485
CRIII . . . . . call
Cut sheet feeders and tractor feeds available
IDS
Prism 132 w/color. . . . . call
Prism 80 w/color . . . . . call
Prowriter 8510 . . . . . call

Micro Storehouse Special
SuperCalc 3. . . . . $210

For orders, call toll free:

1-800-554-7661

For information and compatibility questions, call 404-577-8892 and ask for our user friendly sales staff.
Prices subject to change without notice.

CIRCLE 422 ON READER SERVICE CARD

PRODUCT REVIEW

Most Programs Fit Desq Nicely

A hands-on look at installing and running programs in Quarterdeck's operating environment

BY ROBIN WEBSTER

Desq
Quarterdeck Software
1918 Main St., Suite 240
Santa Monica, CA 90405
(213) 392-9851
Price: $399
Requires: 320K RAM, 5-megabyte hard disk

Until now, MS-DOS software has not been noted for its good manners. Many programs have been designed to operate as micro dictators; when loaded into memory, *they* are in charge and no other package can even take a peek.

With the launch of *Desq*, the multiwindowing program from Quarterdeck Office Systems, it looks as if no single PC-DOS program need ever reign supreme again (see "Will Desq Top Windows," *PC*, Volume 3 Number 12, page 33).

The version of *Desq* now available looks different in only a few ways from the product I saw about 8 months ago (see "Through an Open Window," *PC*, Volume 3 Number 7). It has been prettied-up to a large degree, and some details (such as the window border design and menu option selection keys) have been redesigned. It is also physically larger.

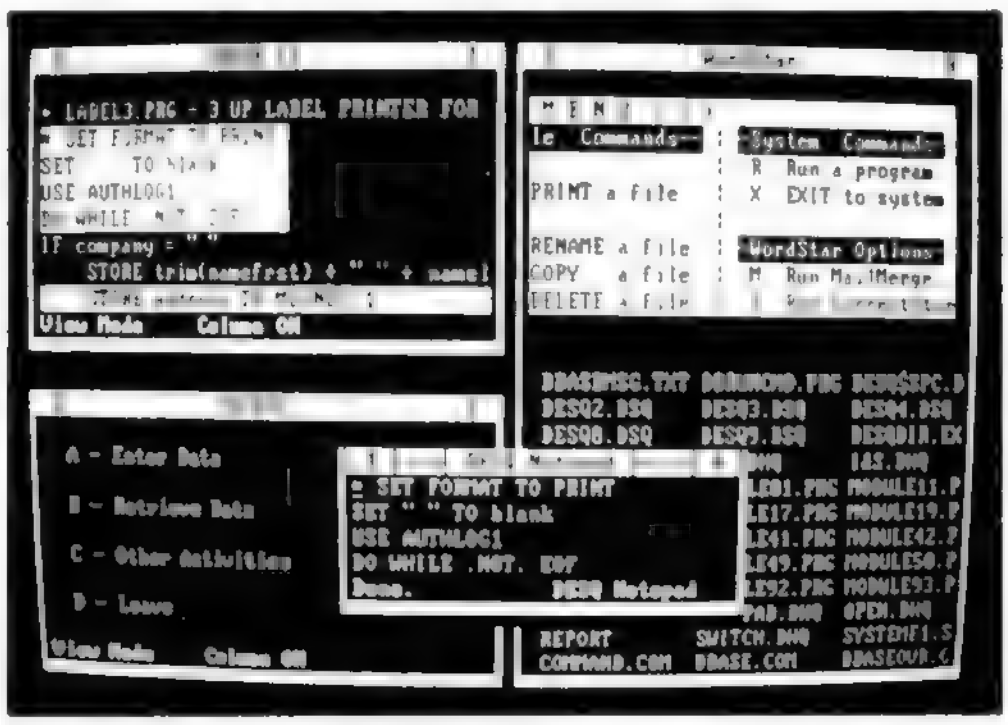
The version of *Desq* now being shipped requires a minimum of 320K RAM (256K for *Desq* itself and 64K for applications) and a 5-megabyte hard disk. To be really useful, however, *Desq* needs 512K of breathing space to support more than a couple of applications in memory at one time.

Color Preferred

My testing of the first released version of *Desq* was carried out on an IBM XT with 512K RAM and a color monitor. The color monitor is not essential—*Desq* will cope with a basic monochrome display set-up and with a monochrome screen linked up to a color/graphics monitor adapter. Obviously, though, the visual support provided by various application windows set in different, vivid color combinations is lost with monochrome displays.

A mouse can be used as a selection device with *Desq* (the Microsoft, Logitech, and Mouse Systems products are supported), but it is not compulsory. My test was carried out without a mouse, but I would recommend using one if you intend to work with many applications—and therefore many windows—on the screen at one time. It facilitates selection of windows and their contents.

To switch between windows without a mouse, you must first tap the Alt key and then enter the number of the window you wish to work with. (For example, Alt-1 makes window 1 active.)



Every window is identified by a unique number, which is very important since you can end up having different windows with the same name if you are not careful. The active window is always in front of all other windows; it has special bars in the top window border.

According to Therese Myers, president of Quarterdeck, first-time or naive users should not try to install applications or set up complex interconnections between applications all by themselves. Myers feels this is one job best left to those skilled in the dangerous art of deciphering software and hardware manuals.

While there is much sense in this, the *Desq* manuals themselves are quite easy to follow and installing the system on my XT presented no problems.

Desq Tricks

You must be familiar with DOS 2.0 file structure commands so that you can tell *Desq* when to change directories, and so forth. It also pays to read the installation notes in the *Desq* manuals carefully since there are a few hints on how to make *Desq* operate as smoothly as possible.

Desq comes on four disks: the *Desq* Starter Disk, two additional system disks, and the Agent Library disk.

Inserting the Starter Disk into drive A: and typing INSTALL begins the installation. It took about 5 minutes to copy all the necessary files onto the hard disk from the Starter Disk. On checking drive C: (the hard disk), I realized that *Desq* had automatically created its own DOS 2.0 directory called DESQ. All *Desq* files were stored in this directory.

Getting to Work

It is possible to start working with *Desq* in a small way at this point, although no MS-DOS applications have been installed. Its menus will function, you can type text into Desq Notepad, a simple screen-based editor, and you can manipulate DOS files on any attached disk drive via *Desq*'s rather impressive File and Print main menu option.

This last option is a great improvement on the way in which PC-DOS directory information can be handled. Have you ever wanted to sort your directory in a meaningful way? Have you ever wanted to move among the contents of a directory and do all the things PC-DOS allows you to do by choosing them from a menu? If so, Quarterdeck's handling of these facilities will please you.

Windowing systems can appear to the user in a number of ways: icons that are pictorial representations of a program or document, as with the Apple Macintosh; a mixture of menu options and "almost icons" (simple graphics), as with the Visi On system; or a ubiquitous main menu and a host of application-dependent submenus, as with *Desq*.

Agents Aid Applications

One disk supplied by Quarterdeck is labelled the Agent Library. An agent, in *Desq* parlance, is an easy-to-use interface that provides support for a particular application. So if an application provides for the deletion of files by some contorted control key sequence, a *Desq* agent will provide a much sim-

(continued)

Wordstar® Wordprocessing and SuperCalc 3™ Integrated Spreadsheet now included Free with all Seequa computers.

SEEQUA SHOWS YOU HOW TO GET AN IBM PC FOR JUST $1995.

BUY A CHAMELEON BY SEEQUA.



The Chameleon by Seequa does everything an IBM PC does. For about $2000 less than an IBM.

The Chameleon lets you run popular IBM software like Lotus® 1-2-3™ and dBase II.® It has a full 83 key keyboard just like an IBM. A disk drive like the IBM. And a bright 80 × 25 character screen just like an IBM.

But it's not just the Chameleon's similarities to the IBM that should interest you. Its advantages should, too. The Chameleon also has an 8 bit microprocessor that lets you run any of the thousands of CP/M-80® programs available. It comes complete with two of the best programs around, Perfect Writer™ and Perfect Calc.™ It's portable. And you can plug it in and start computing the moment you unwrap it.

So if you've been interested in an IBM personal computer, now you know where you can get one for $1995. Wherever they sell Chameleons.

The Chameleon by

SEEQUA COMPUTER CORPORATION
8305 Telegraph Road
Odenton, MD 21113

Chameleon shown with optional second disk drive.

To learn more about Seequa or for the location of the Seequa dealer nearest you, call (800) 638-6066 or (301) 672-3600.

IBM is a registered trademark of International Business Machines Corporation.

CIRCLE 370 ON READER SERVICE CARD

When you're last to the party, you better bring something special. Like a 10 Megabyte Winchester for $888.

Hard Right

You could safely say we are just about last to the Winchester add-on party. For two years we have searched for the right components at the right price. Anybody can buy controllers and drives, make up a name, and presto, they are in the hard disk business. But to do it right, takes much more than just bundling the nearest components.

Anybody Want a V-8?

Adding a hard disk to an IBM PC can be very much like stuffing a V-8 engine in the back seat of your VW bug. There is room to put it there, and you will have one fast beetle—but you create a whole new set of problems. Like excessive power drain which results in heat.

Cool & In Control

Qubie' has attacked the power/heat problem with a state of the art controller and drive that draw less power than any on the market today. Start with our controller. It is three times faster than the controller in the IBM PC/XT. The controller uses LSI (Large Scale Integration) technology to lower the number of components on the board. Fewer components require less power. Less power means less heat. More power left for other expansion boards, and lower operating temperatures inside your PC. Don't forget our low power drive. It draws the same amount of power as a floppy disk, and is the lowest power consuming drive on the market today.

Sitting Or Standing

Since PC's seem to be getting more and more portable we decided we selected a drive that can be used in the desktop or portable PC. Our drive uses plated media. Plated media can stand up to the rigors of the real world. Special design of the drive allows it to operate at any angle. No need to treat your PC like a piece of antique china just because you have added a hard disk.

Complete Package

Included in the package is everything you need to install it yourself. A 10mb Winchester drive, controller, cables, mounting hardware, and step by step instructions to explain the installation. You can use PC-DOS version 2.0 or 2.1 without any modifications.

Why Buy From Us

Because besides having the best hard disk system on the market, we stand behind it and you. You get direct technical support after the sale. If at any time during the one year warranty period your system should require service, we will fix it or replace it within 48 hours.

Notice there are no hidden charges in our price. No extra for freight, credit cards, COD fees, or insurance. If you still are not convinced, and are ready to buy another brand of hard disk, ask them if they will take our acid test.

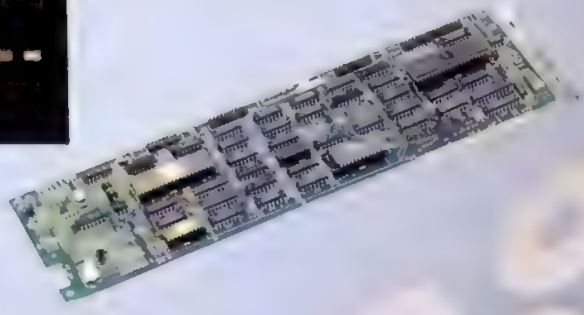
The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on our hard disk system. If for any reason you are not satisfied with your purchase, you may return it for a complete refund including the postage to return it. If you can, get any of our competitors to give you the same guarantee. Buy both and return the one you don't like. We know which one you will keep.

Qubie' PC10 with 10 Megabyte hard disk, controller, cables, installation hardware, and Instructions. 1 Year Warranty. $888

IBM is a trademark of International Business Machines Corporation





Plated Media for Rugged Performance

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $12 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie' 1984

CIRCLE 384 ON READER SERVICE CARD

Desq *(continued)*
pler one-key method of doing the same task.

Agent support is available once you have installed the relevant file from the Agent Library disk. The first version of *Desq* comes with 12 agents that provide support for the so-called "hit" packages (*dBASE II*, *1-2-3*, the *PFS: File*, *Report* and *Write* programs, *VisiCalc*, *Fast Graphs*, *MultiMate*, *Multiplan*, the *SuperCalc* programs, and *WordStar*).

Others will undoubtedly follow, but you don't have to wait. By choosing the Install and Setup menu option and telling *Desq* that you want to create your own agent, it is possible to install almost any PC-DOS program in the *Desq* environment.

Installing WordStar

I decided to install the *WordStar* agent from the Quarterdeck disk first, since I had loaded all the necessary *WordStar* files in the root directory on my XT's hard disk. The installation was, again, very smooth, taking about 5 minutes to complete. Upon opening a *WordStar* window, however, I was greeted by the error message "File WSMSGS.OUR not found."

When I traced the problem, it seemed to me that *Desq* initially looked for the WS.COM file in the root directory but then returned to the main *Desq* subdirectory, where, of course, it couldn't find any of the other *WordStar* files. This caused all sorts of problems, requiring me to press the Esc key more than a few times. In fact, at one point the contents of the *WordStar* window "fell" out of the window border and lay scattered all over the screen.

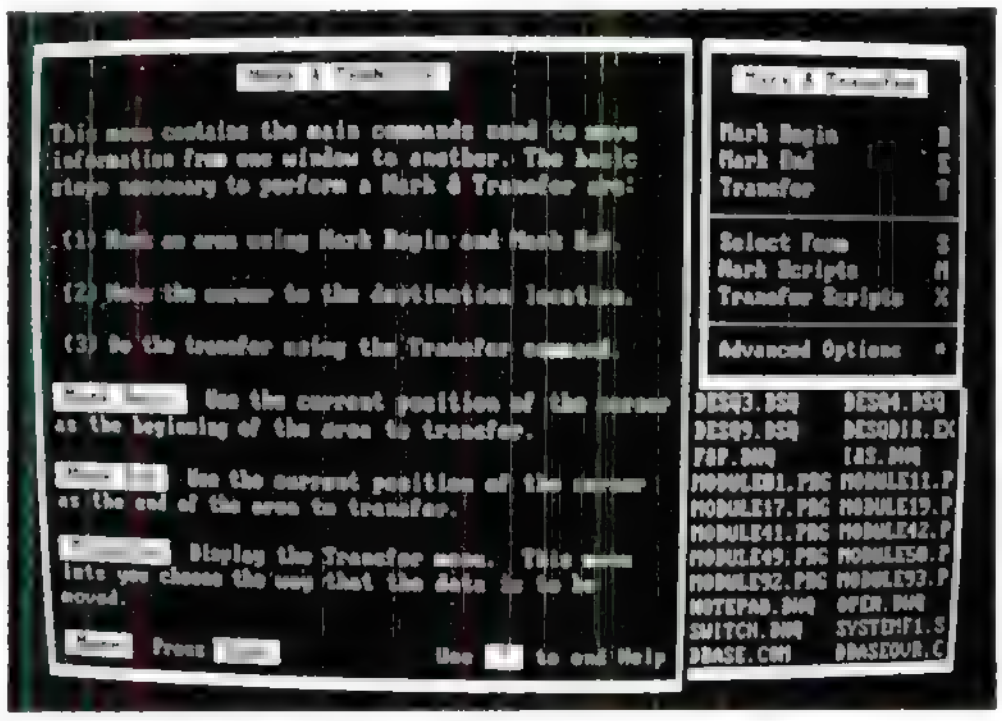
A quick solution was to copy the *WordStar* files over to the *Desq* directory. *Desq* seemed to be much happier and I could use *WordStar* without difficulty.

Keying Functions

Quarterdeck has decided to go with letters instead of function key numbers on its command menus. While using *WordStar*, it became obvious to me that all was not well.

Desq's agent provides a menu for *WordStar* that includes features like Help, Left Margin, Underline, and Bold. You call up the menu by pressing the Alt key once while working in a *WordStar* window.

I pressed the F1 (Help) key at this point, but instead of any kind of special help text appearing, the Ctrl-S (Save File) command was issued. Pressing the F3 (Left Margin) function key did not produce the required result either; instead of displaying the expected prompt asking for the location of the left margin, *WordStar* merely deleted the character to the left of the current cursor location.



Instead of the *Desq* operation taking effect, *WordStar's* own function key assignments were taking precedence. This was a bit confusing. Simply using conventional keyboard commands, *WordStar* worked as expected and its performance was really no different from when it is used outside of *Desq*.

Entering the Unknown

Out of curiosity, I installed a demo version of the *Intecalc* spreadsheet system from Schuchardt Software. The *Intecalc* demo was self-running; the disk contained an AUTOEXEC.BAT file that loaded all the necessary files to start the demo.

I decided to leave *Desq*'s default 64K memory allocation for *Intecalc* alone for the moment and tried to run the program. On opening the window for *Intecalc*, I watched the batch file load. (Having installed the agent for *Intecalc* I could now start the program by simply entering IN for *Intecalc* when given the relevant prompt.) Unfortunately, all I saw was a brief complaint that *Intecalc* was "too big to fit in memory."

After setting up a higher memory space for *Intecalc*, I managed to run the program within *Desq* and encountered only a few minor problems. *Intecalc* tried hard to remain within the window borders set up by *Desq*, but would occasionally write a random character to the bottom right-hand corner of the screen, sometimes on top of other window contents that occupied that space.

Scrolling within the window borders tended to cause the window contents to move around erratically. These problems are probably a result of *Intecalc* bypassing standard PC-DOS BIOS calls or handling them in some unusual manner. *Intecalc* is not mentioned in the Quarterdeck "approved list" anyway.

Other programs I've used successfully with *Desq* include *SuperCalc*, *1-2-3*, *dBASE II*, and *Friday!*. While it was not possible to put them through all their paces under *Desq*, I was impressed by how much I could do to make such programs work together.

Mark and Transfer ("cut and paste" in other systems) operations allow *Desq* users to take a collection of data from one type of application program and to transfer it to another, just as they might move a block of text around within a word processing document.

It is not a one- or even two-shot process. You have to place the cursor at the beginning of the data you wish to transfer, select the Mark and Transfer menu, mark the beginning of the data (whereupon the menu disappears), place the cursor at the end of the data area to be moved, call up the Mark and Transfer menu again, mark the end of the data (whereupon the menu disappears again), switch to the destination window, call up the Mark and Transfer window a final time, and select the transfer option.

I may have labored the point a little, but this is just an indication of the way in which *Desq* goes about many procedures—whether transferring data or changing the background color in a window.

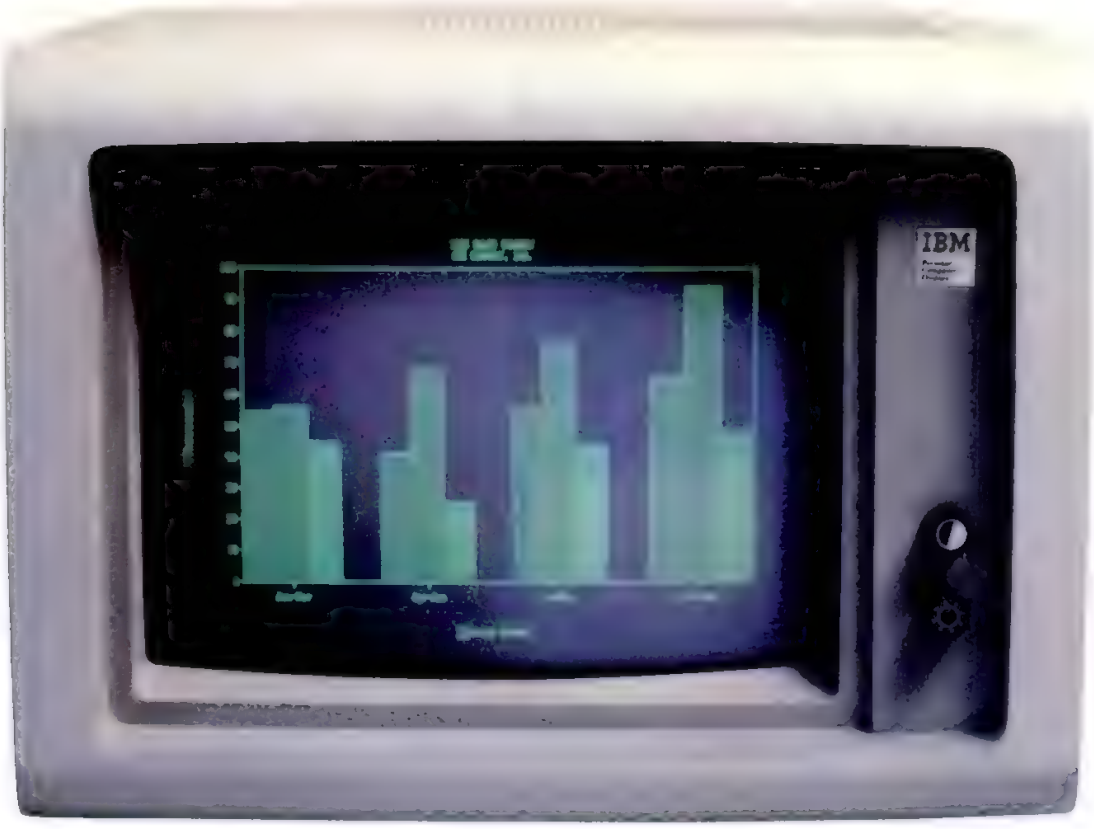
A very important feature of *Desq* is its Learn and Scr. .ts facilities. Although *Desq* does make the job of integrating diverse packages quite easy, it would be a waste of energy to set up links between programs every time you boot up the system. Learn puts *Desq* into a mode that records everything you do—mistakes and all. Without such an ability it would be just another pretty windowing package.

If you link three or four packages together to create a hybrid accounting package, the learn facility will store the sequence of events in the form of a named file, called a Script.

A Script can be repeated a specified number of times and can include "pauses" that temporarily halt the Script to ask the user to input variables. The Learn and Scripts features made *Desq* viable as a program integrator.

While I had problems getting some programs to work as I wished, this is a function of both how well each product is installed and how well it is suited to the *Desq* environment. *Desq* itself was very robust and never actually crashed. The only danger is that it is extremely flexible—so flexible that you must pay great attention to details if you want all the various parts to mesh together successfully. I like the product and think that it is well worth the $399 asking price.

Desq is rather like a teacher in charge of a playground full of children. Most of the children play happily, but occasionally some are just not manageable.■



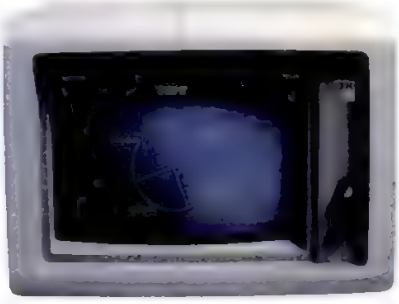
At last... Lotus 1-2-3™, graphics, 132-column spreadsheet, expandability and much more for your IBM® Monochrome...on a single board: UltraPAK™

Introducing the only board that does it all for your IBM PC. In one slot. At low cost. The UltraPAK: it's everything you ever wanted for your PC.

Never has one single-board package given so much instant and future capability to the IBM PC. From Lotus 1-2-3 compatibility and 132-column display to high resolution color graphics, user-expandable memory and disk controller plus other features and options, the UltraPAK is the board to build your IBM PC on.

Produced to the most demanding and advanced levels of quality, 100% tested and guaranteed for a full year, the UltraPAK represents the ultimate in single-board reliability, innovation and capability. Only from Tseng Laboratories, Inc.





SINGLE-BOARD COMPARISON CHART

	TLI	Hercules	CCS
Bit-mapped graphics	Standard (2 page)	Standard (2 page)	Option (1 page)
132-column x 44-row spreadsheet	Standard	NA	Standard
IBM display compatibility	Standard	Standard	Standard
Parallel port	Standard	Standard	Standard
Serial port	(2) Standard (one std. one opt.)	NA	NA
Clock calendar w/battery	Standard	NA	NA
User-expandable (One option per UltraPAK board):			
IBM disk controller w/wo 256K memory	Option	NA	NA
384K memory w/RAM drive	Option	NA	NA
IBM color/graphics* or high resolution color graphics* (640 x 400 w 16 colors)	Option	NA	NA

*For simultaneous display on a separate color monitor.

Tseng Laboratories, Inc.

205 Pheasant Run, Newtown Commons, Newtown, PA 18940.
(215) 968-0502. Telex 705179
Enhancement technology for personal computers.

Suggested Retail Price $680
See your authorized TLI dealer.

Visit us at COMDEX, Booth 6256.

Lotus and 1-2-3 are trademarks of Lotus Development. IBM and PC are registered trademarks of International Business Machines Corp.

CIRCLE 207 ON READER SERVICE CARD

Compu-Chef: Now You're Cooking

BY MARK MALAMUD

Compu-Chef
DeAmicis Software Development
Oceanside, CA 92056
(619) 758-4766
List Price: $30
Requires: 128K RAM, one disk drive, PC-DOS.

Remember this episode of *The Honeymooners?*

"Oh, Chef of the Future–Can it core *a* apple?" Ed Norton asks innocently, dressed as the Chef of the Past in Ralph Kramden's TV commercial for a new-fangled, triple-purpose kitchen utensil.

"Can it core *a* apple!!!" Ralph replies confidently, brandishing forth what looks like a futuristic, multipronged fork, "Why, let us compare the ways of the past with the ways of the future...."

And so begins yet another failure for Ralph Kramden, the bus driver with big dreams of success but little chance at it. For no sooner than Ralph's words have been spoken than the Chef of the Past, armed only with an old-fashioned apple corer and determined to demonstrate the inefficient ways of antiquity, cores an apple with acrobatic dexterity and super speed, the likes of which the Chef of the Future never even dreamed possible. So much for the kitchen of the future.

Which brings us to *Compu-Chef,* a new product from DeAmicis Software. Created by a chef at a hotel and spa in Carlsbad, Arizona, *Compu-Chef* is essentially a cookbook on disk. It contains 90 recipes in categories ranging from cold appetizers to hot entrées and includes such exotic continental fare as salmon sauté with creamy herb sauce, zabaglione with brandy, and Cherries Jubilee.

Compu-Chef automatically calculates the quantity of ingredients necessary to prepare between 1 and 50 portions of any dish. It also allows you to create and save your own recipes (up to 18 lines per recipe) on a separate disk so you can build a private recipe library.

For those who need reference materials in the kitchen, the program also contains some interesting appendices including a comprehensive list of culinary terms and herbs. There is also information about caloric content and cost-per-portion of certain dishes.

Hold that Recipe

Although *Compu-Chef* has some intriguing features and is fun to browse through for 30 minutes, is it ultimately any better than a cookbook and card filing system? The only thing the program seems uniquely suited to is the calculation of the proper amount of ingredients necessary to prepare a specified number of servings. Of course, a little basic math on the back of a napkin can accomplish the same task and save $30.

Also, to make the program's appendices easy to use, *Compu-Chef* advises you to print a hard copy of the data. How is this any better than having a book in the first place?

By the Book

Finally, who keeps a PC in their kitchen? Granted, you don't need a PC next to your stove to make use of *Compu-Chef,* but then, who keeps their cookbooks in the den? All in all, *Compu-Chef* is a sincere but ultimately awkward recipe index.

So it looks as if your grandmother's cookbook has not gone the way of the abacus—at least not yet. The computer may someday make the household chef very happy with cross-references, linked lists, instantaneous calculations, and direct lines to *Cordon Bleu* in Paris. But today, when PCs can be found in almost any part of the house *but* the kitchen, publishers of best-selling cookbooks have nothing to fear. The Chef of the Future is still far away.

But, certainly *Compu-Chef* will avoid Ralph and Ed's dilemma of how much rice is nice. Their solution was at least—*at least*—a cup of dry rice for each person, because, as they reckoned, "We all like rice." ■

Speaking of Computers: Laughable Data

"Then there is Apple with its 20-page inserts to try to convince you that a black-and-white monitor on a 16-bit computer with 80K available to the software writer with a single disk drive and no numeric key pad or cursor keys is great! If you think about it very much, you'll laugh."

John V. Roach, keynote speaker at COMDEX in Atlanta, Georgia, May 1984

Word Processing Lowers Stress, But Does It Raise Salaries?

DETROIT—What do 507 secretaries think of word processing? They love it—or at least 83 percent do, according to a survey by Kelly Services, Inc. on secretaries' attitudes. Only 16 percent have mixed feelings about word processing and none say they "hate it."



Word processing makes work less stressful, say 63 percent of the surveyed secretaries, and 76 percent say that the word processor allows them to "spend less time typing and more time doing work that involved more responsibility and decision-making." As to fears that electronic office equipment might eliminate their own jobs, only 5 percent are "very" or "somewhat" concerned.

Does electronic equipment open up new opportunities for secretaries? Sixty percent think so, and 12 percent think it's likely they'll become computer programmers. Already, 21 percent know how to program a computer using a language like BASIC or COBOL; among secretaries under 25 years old, 31 percent can program. We wonder if they'll find a faster track to hacking now that IBM offers its traditional dedicated word processor, Displaywriter, as software that runs on the more-programmable PC.

Comparing the answers to several questions in this survey reveals that secretaries might become disillusioned with word processing if they look too closely at the bottom line. Although 88 percent say that learning about word processing has influence on increasing a secretary's salary, only 30 percent have actually received pay increases as a result of word processing skills.

Even though the corporate name of Kelly Services, Inc. plays down the company's "Kelly Girl" image, this survey reveals that being a secretary is still mainly "women's work." Of the secretaries that were interviewed, nearly all—99 percent—were female. And while 45 percent would recommend a secretarial career to a daughter, only 11 percent would suggest this profession to a son.

The full *Kelly Report on People in the Electronic Office,* is available at no charge from Kelly Services, Inc., Public Relations Dept., GPO Box 1179, Detroit, MI 48266.

—James Langdell

[redacted]

Compucard: Checking Your Rolodex

Compucard
Rolodex Corporation
245 Secaucus Rd.
Secaucus, NJ 07094
(201) 348-3939
List Price: $49.95
Requires: 64K RAM, two disk drives.

Rolodex, the company that brought you the popular Rolodex card-filing system, recently came out with its contribution to the computer age: *Compucard*. This computerized card-filing system streamlines the problem of duplicating, crossfiling, adding to, and otherwise handling the Rolodex filing system.

The package comes with a system disk and short, easy-to-read manual. The Rolodex cards, which are sold separately, are attached at perforations for use by most printers.

The software has a few bugs. On a double-drive PC, the program refused to run unless there was a data disk in the B: drive—even though a file containing 20 entries fit on the system disk. And although the manual states that it is compatible with hard disk systems, the software balked on a 512K PC-XT, insisting that a minimum of 64K RAM was needed to run the program.

Compucard is driven by a number of menus. After setting up a card set by naming it and choosing a card size, printer type, print size, and set size, you are ready to begin entering data. There is no way to edit the setup once it is entered. If you make a mistake during the process, the only way to alter it is to delete the original setup.

The program offers a small mockup of a typical Rolodex card. Either type in your information in any fashion or set up what the program calls a zyp template, which allows you to create specific record entries.

```
 --+----+----+----+----+----+----+------
 | NAME: GEORGE WASHINGTON, ESQ          |
 | CO: PRESIDENTS, INC                   |
 | ADDRESS: 1 WHITE HOUSE RD             |
 | CITY/STATE: WASHINGTON, D.C.          |
 | ZIP: 02121                            |
 | PHONE: 000-0000                       |
 -------------{ }-----{ }-----------------
    C-change E-erase P-print Q-quit

      B. BROTHER          1984 LTD
      J. ROCHESTER        GOVERNNESS, INC
      J BROCKHURST        JUNGLE DREAMS
      JOHN STYLES         PICKWICK CLUB
      SAMUEL PICKWICK     PICKWICK CLUB
---->  MARTHA             PRESIDENTS
      ZYP TEMPLATE1       ZYP TEMPLATE1
      * End-of-List *       *     *
```

These tabs and a variety of control codes can be used to alter or delete records or search for duplications. But Rolodex didn't see fit to include any sort of help menu at the bottom of the screen, relying instead on an easily lost "Quick Reference Card".

Once the file is completed, *Compucard* will print it out neatly. The program also automatically prints the dates of when the card was first entered and of the last update.

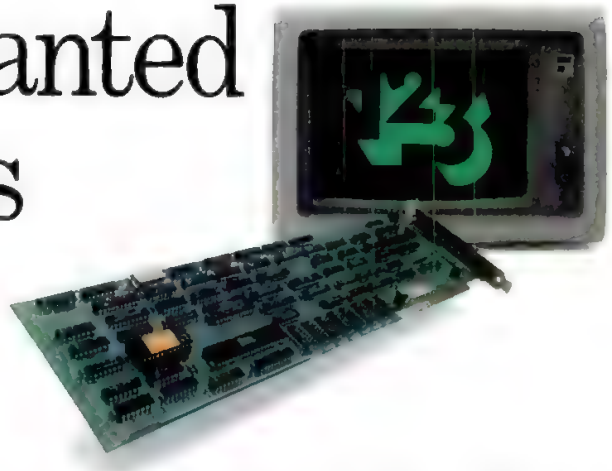
Compucard is a handy system for offices with many common phone numbers that must constantly be organized or updated. It satisfies one to see a multitude of Rolodex cards being neatly and quickly printed. It's too bad that the program is marred by so many easily correctable problems.

—Barbara Krasnoff

Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
June 28–July 1	Milwaukee Computer Showcase Expo	Hardware and software.	MECCA Milwaukee, WI	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3300 (617) 449-6000
July 9–12	1984 National Computer Conference	Granddaddy of them all—hardware, software, seminars.	Las Vegas Convention Center Las Vegas, NV	AFIPS, Inc. 1899 Preston White Dr. Reston, VA 22091 (703) 620-8940
July 11–12	Personal Computer Local Network Seminar	Seminar on PC local network market.	Hyatt Regency San Francisco, CA	Architecture Technology Corp. P.O. Box 24344 Minneapolis, MN 55424 (612) 935-2035
July 16–17	Computer Security Workshop	Workshops on security needs and concerns of IBM, compatible users.	Marriott Crystal Gateway Arlington, VA	Computer Security Institute Dept. IP, 43 Boston Post Rd. Northborough, MA 01532 (617) 845-5050
August 16–17	Local Area Networks	In-depth look at local area networks.	Ramada Inn—Old Town Washington, DC	Institute for Advanced Technology Control Data Corp. 6003 Executive Blvd. Rockville, MD 20852 (800) 638-6590 (301) 468-8576

When Lotus™ wanted better graphics for 1-2-3™, they chose a better graphics card–HERCULES™.



And then we became a standard.

When the IBM® PC was introduced over 2 years ago, the talented people at Lotus realized that it was limited by a lack of high resolution graphics. They knew that this was going to have an adverse effect on 1-2-3's graphics. And Lotus didn't want anything to hold back their revolutionary software.

So they turned to Hercules.

Lotus recognized that the Hercules Graphics Card delivered the performance they wanted. It offered high quality text and high resolution graphics on IBM's monochrome display. It completely replaced the IBM monochrome card. And it didn't cost an arm and a leg.

Since then, Hercules has sold a lot of Graphics Cards. So many that the Hercules Graphics Card has become the high resolution standard for the IBM PC. And this means that there is more high resolution graphics software available for Hercules than for any other graphics card you can buy.

Software like Microsoft® Word. Our high resolution makes Word's text much sharper and easier on your eyes. And there are other programs for business graphics, computer aided design, terminal emulation and programming.



Call for our free information kit. See why the company that made the first graphics card for the IBM PC still makes the best.

Hercules. We're strong on graphics.
800 255 5550 Ext. 400

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** IBM monochrome display graphics resolution of 720×348; parallel printer port; text mode software compatibility; free software for programming; 2 year warranty. **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; SourceWare/Australia. Trademarks/Owners: Hercules/Hercules Computer Technology; Microsoft/Microsoft Corp; IBM/International Business Machines; Lotus & 1-2-3/Lotus Development.

[illegible]—Free for the Taking

Free software? Yes, and you can get your hands on it from several sources without resorting to piracy. PC users have written programs and placed the code in the public domain, giving legal authority to fellow users to copy, run, customize, and improve the software. Programming utilities, games, fancy screen illustrations, and even full languages, word processors, database managers, and spreadsheets are available.

Some of the most popular and powerful programs in the public domain, such as *PC-File*, *PC-Talk III*, and *CHASM*, are "user supported" products. Although you can obtain any of these programs free through public domain channels, the software's author asks that you send a donation if you like it.

If you don't know where to find public domain or user supported software, the following sources can provide information and even the programs themselves.

Many PC users groups distribute public domain software to their members. Contact a local group to find out what programs are in its library.

Free as the Air

Another way to obtain public domain software is to dial up a PC user bulletin board that offers programs for downloading to your PC.

One book that dips into this ever moving stream of telecommunications is *Free Software for the IBM PC* by Bertram Gader and Manuel V. Nodar (Warner Software/ Warner Books, New York, 468 pages, $8.95). This book lists all the files on over 40 bulletin boards devoted to IBM PC users.

Gader and Nodar also thoroughly explain how to contact a bulletin board and how to set one up. They point out that there's even a piece of public domain software, called RBBS-PC, that helps you set up a public domain software bulletin board of your own.

Pulling a useful or entertaining program out of thin air from a bulletin board is the closest thing to entirely free software, but the long-distance charges can add up if a long program you desire can't be obtained from a bulletin board close to home. If you'd rather get your software on disks sent through the mail, we can suggest two good sources.

One is the PC Software Interest Group (PC-SIG), which publishes the *Directory of Public Domain Software for the IBM PC*. The PC-SIG offers over 135 disks of software, most with at least a dozen programs or files, which are described in its 110-page directory. Programs can be obtained from PC-SIG by sending $6 per disk plus $4 per order for shipping. This price covers the disk and time that go into making you a copy of this not-quite-free software. The directory costs $4.95 (plus $1 for postage) from PC-SIG, 1556 Halford Ave. #130, Santa Clara, CA 95051, (408) 730-9291.

Another publication that lists public domain software is *IPCO Info*, the bimonthly newsletter of International PC Owners, Inc. (Box 5100, Poland, OH 44514). Each issue catalogs IPCO library of about 300 public domain programs, which you can order for $3 per program and $6 per disk; about 20 disks with fixed selections of related software (such as all games or all graphics) for $15 each; and 16 user-supported "freeware" programs for $6 each.

IPCO Info describes individual public domain programs more thoroughly than do the other publications. Each issue also reprints many pages of tips, comments, and gossip culled from messages left by PC users on bulletin boards. Subscriptions are $20 for six issues, $30 if you want issues sent by first class mail.

—*James Langdell*

Duped by CorrectStar? Here's Why

A number of *PC*'s attentive readers are puzzled by the MicroPro *CorrectStar* "Winning-Words" Instant Winner Game that ran as an advertising insert in *PC*, Volume 3 Number 10. The contest promoting MicroPro's new spelling checker offered prizes to people who found one or more of the words *CorrectStar*, *ocean*, *prism*, *idol*, and *array* hidden in a grid of eight letters across and ten letters down. The Grand Prize for finding all five words spelled correctly was $4,000 or a luxurious week in Paris for two.

Many of *PC*'s readers jumped at the chance for a week on the Continent. When they scratched at the ink-coated grid in hopes of uncovering *CorrectStar*, however, their mental spelling checkers flashed red. "I for one cannot fit an 11-letter word in an eight-by-ten matrix. Could you please tell me what MicroPro had in mind?" wrote William McDonald of Salem, Virginia, one of several readers who wrote to *PC Magazine* questioning the validity of the contest.

Our readers are right: You can't fit an unbroken 11-letter word horizontally or vertically or even diagonally in a grid whose largest dimension is ten letters.

The answer to the problem, according to MicroPro, is to use a little creative spelling. After all, says spokesperson Judi McClean, the rules don't object to listing the words *Correct* and *Star* in discontinuous sections.

"We are sorry your interpretation of the rules of this game created some confusion," reads a letter MicroPro has drafted in response to readers experiencing gridlock. "As you can see on the copy of the Grand Prize-winning card, *CorrectStar* appears horizontally. Even though it appears on two lines, the word is spelled correctly and horizontally as stated in the rules. As per the rules, all major prizes in this game will be awarded."

The decision to break *CorrectStar* into sections was made because of size limitations for magazine advertising inserts, McClean says. ■

Smart Gets Project Processing

OVERLAND PARK, Kansas—*Smart* software sounds like a good idea, if only because of its name.

In the rush to carve a niche in the integrated software market, Innovative Software, Inc., here has added project management capabilities to its $895 integrated bundle.

Innovative, which has been successful with its *TIM IV* database manager, calls the added capability "project planning." The company envisions that this will appeal, for example, to a credit manager who needs to send dunning letters to anyone owing more than $1,000. The manager would initially set up the project using *Smart* macros; the system would first use the spreadsheet portion to determine who owes $1,000 that month, and then transfer that information to the word processing package to prepare the letters, explained Michael J. Brown, Innovative's president.

The project planning capability enables users to take an old project and revise it to handle the latest situation. *Smart* users can view and work on multiple files running in tiled windows on a color monitor and transfer data from other existing packages.

Help facilities are extensive, but as users become more expert at manipulating the sophisticated word processor, the super spreadsheet with high-resolution graphics, and the data manager, they can cut back on the amount of help they receive. On-line commands have been divided into three levels of complexity so that novice users are not confused by an array of options as they begin to use the software, but are not limited either as they become more proficient.

Smart is currently available through its dealers as three individual modules: the word processor is $395; the spreadsheet-and-graphics module is $495; and the data manager is $495. ■

Micro-to-mainframe:

Before you settle for a simplistic solution, ask a few serious questions.

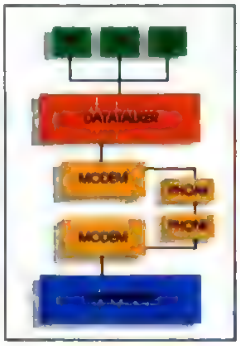


Choosing a micro-to-mainframe communications system is no game.

So before you toy around with "easy" solutions, ask some serious questions.

Will this product support full IBM Terminal Emulation?

Make sure the system can emulate remote batch and interactive IBM terminal systems.



Suppose something goes wrong with the unit?

The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.

What about future product development?

Make sure the products you're going to need soon will be available soon.

Does the company offer a variety of products?

You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.

Who am I dealing with anyway?

How long have they been in business? The longer, the better.

How much is all this going to cost?

Here's a point of reference: Our own DataTalker product line will give you all the capabilities and services just described for as little as $695. Complete. If you'd like to know more, contact our Marketing Support Group at 1-800-321-7785.

Can I get fast answers to my questions?

Insist on toll-free access to qualified service personnel before and *after* the sale.

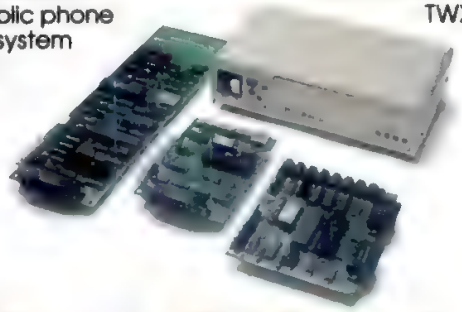
What if I need a quick analysis of a problem?

Ask if the manufacturer has a Communications Test Center for product testing over public phone lines. And find out if the system has internal diagnostics.



Providing Data Communications Solutions

Winterhalter, Incorporated
3853 Research Park Drive
P.O. Box 2180, Ann Arbor, MI 48106
313/662-2002 800-321-7785,
TWX 810-223-2423
TELEX 234-216



DataTalker™

By Winterhalter, Incorporated

Winterhalter, Incorporated has been providing data communications solutions to major manufacturers of microcomputers and word processors since 1978. Our DataTalker front-end processors and PC boards are used by companies around the world, from start-up manufacturers to the Fortune 1000.

Now available for the IBM PCjr.

NASDAQ SYMBOL WNTL

CIRCLE 185 ON READER SERVICE CARD

People in the News: Jeff Garbers

The creator of Infoscope keeps the human side of software in his view

BY JAMES LANGDELL

ATLANTA—Imagine that! A young programmer who has used computers most of his life has created a program that lets people imagine they've understood computers all their lives. Competence is rarely so contagious, but 23-year-old Jeff Garbers' talent rubs off on users the right way through *Infoscope*, his data management program, now available from Microstuf, Inc., of Atlanta. (See "A Scope for your Micro" in this issue for a review.)

Infoscope lets you start right in, organizing and sorting data in various ways without having to define everything in advance. You can add new fields to a file at any time and the program automatically expands fields to fit the longest item. "Early on," says Garbers, "you don't have to make decisions where you debate with yourself, 'Well, I don't want the name fields to take up a lot of memory, but I don't want to alienate any eastern European friends by chopping off their long names.'"

Infoscope also offers help windows for all occasions, but usually you can enter the first command that comes to mind and the program will do what you want. These uncommon accomplishments were made possible by Garbers' painstaking attention to the human side of software.

Computer skills came easily—and early—to Garbers. He recalls that when he was 11 years old he saw some of his father's IBM manuals, became interested in them, and taught himself COBOL.

Human Factors

As fluent as Garbers became with computers, he realized most users don't have the interest or patience to do what he had done—take the time to figure out obscure programs.

Garbers' point of view was nurtured in his studies with Dr. Albert Badre of Georgia Tech. While working on his doctorate, Garbers took a computer science course in human factors from Badre, who "opened my eyes to the potential of programming for human beings." The class explored how programmers could apply aspects of cognitive psychology.



Badre assigned his class the project of programming a home library system—but he added a cognitive twist. "He split us into two groups and didn't tell either group what the other was doing." Garbers' group was told to write the user manual and then the program; the other group followed the usual fashion of writing the program code and then documenting it.

What did this exercise prove? Garber said his group's program was far easier to use. "By doing the documentation first we were forced to consider a lot of usability issues before we started coding. Unfortunately, that's kind of awkward to do in the 'real world.'"

Birth of a Program

Even so, Garbers and Badre believed their classroom ideas could be used profitably in the real world. They founded Userview Corp. and set about developing *Infoscope*, a product that would "incorporate all this cutting-edge usability stuff we'd been investigating." As president of Userview, Garbers soon discovered that there was a conflict between running a company and being a programmer. "Writing a program is like carrying a child," he says. "While you're doing it, it's the only thing in life that really matters."

In 1982, Garbers the programmer was able to focus on his software after Garbers the president turned Userview's administrative side over to Microstuf, Inc., makers of *Crosstalk*.

Garbers worked on *Crosstalk XVI*, the latest release of Microstuf's communications package. He claims he was able to put much of his programming philosophy to practical use in the new version.

With his own creation, *Infoscope*, Garbers had a freer hand to apply human factors concepts even further. Garbers and Badre paid attention to little things—with a passion. "I doubt that anyone in the software development business," claims Garbers, "sweat and fought and argued as long as we did over one word for a particular command. At first there were different terms for deleting records and deleting fields, but the two words were so close that people tended to confuse them. We finally decided, 'Well, heck! Just use the same word, DELETE, and have users specify whether they want to delete a record or a field.'"

The speed and flexibility of *Infoscope* is possible because the program operates only on files that can fit into the PC's active memory. After Garbers decided that speed and flexibility were his primary design goals, "I knew immediately that there was no way *Infoscope* could involve disk drives except for loading the program and storing complete files."

When a file is nearly too large for *Infoscope* to handle, it's easy to transfer the date file over to another program that can handle it. "If an *Infoscope* user keeps running into the yellow, I'd say he's using the wrong program for the job."

Speedy and Flexible

To compensate for disk neglect, Garbers made it possible for *Infoscope* to use as much RAM as is in a PC. He feels that when using many programs, including *PMate*, his favorite editor, "you can be sitting in front of a system with 640K RAM, but when files get up to 64K you're told it's running out of memory. Hey, come on! People like to be able to use all the hardware they've got."

You don't have to tell *Infoscope* how much memory is available—the program finds the RAM and can use it all. Also, if your system has a printer, color monitor, mouse, or speech synthesizer, *Infoscope* automatically turns on features to match.

Garbers' intent, however, wasn't to make *Infoscope* a program that could do everything. "When people tried it out, some would ask, 'Why don't you put in this and that?' They'd want to add real heavy-duty relational database stuff—like JOIN operations.

"I'd reply that these features would be nice, but it would be like hanging fuzzy dice from the rear-view mirror of a Porsche. They wouldn't fit in with the rest of the design."

Now that Garbers has delivered *Infoscope* after 2 years of labor, he has discovered how true its finished design is to his initial goals. "On a flight to Fall COMDEX, about a year and a half ago, I wrote some notes on an envelope—just brainstorming ideas. I thought I lost the envelope, but it turned up recently, after we started shipping *Infoscope*. I was amazed at how many items on that envelope—natural language, focusing—had actually gotten into the program, even ideas that had notes next to them asking, 'Is this possible?'" For Garbers, it was. ■

INCREDIBLY DIFFERENT Typing INSTRUCTOR™



Typing program. . . gets Gold Star.

(PC Week)

Those in the market for true typing instruction would do well to look beyond the evidence of a name.

Virtuous names like Master and Tutor can cause a buyer to infer typing instruction where none may exist.

A unique exception is the **Typing INSTRUCTOR**™ —a program whose benefits offer true typing instruction, rather than promises of it.

The **Typing INSTRUCTOR** from INDIVIDUAL is the first integrated typing program. It combines professional typing instruction with graphic capabilities to offer totally flexible, multi-function instruction featuring:

- Graphic Introduction to Typing Basics.
- 18 Independent, Interactive Key Lessons for Correct Finger Placement.
- Over 10 Practice Choices including Sentences and a Fast-action, Competitive Game of Chase.
- Informative Introduction to Word Processing.
- Individualized Progress Reports and Helpful Evaluation of Skills.
- Professional Typing Tests In Paragraph Form With Complete Statistics.

The **Typing INSTRUCTOR** has seemingly unlimited choices. You can use the Return or Space Bar. Choose a variety of typing material with different levels of difficulty. Type over 100,000 words. And move from one area of the program to any other at any time.

Being the leading creator of innovative training programs, INDIVIDUAL uses double keystroking in each key lesson and employs reimprinting for correct key sequencing when you make an error.

But perhaps the most distinguishing characteristic of a true **Typing INSTRUCTOR** is its 100% buyer satisfaction. And by this standard none is more authentic than the INDIVIDUAL **Typing Instructor** — ONLY $49.95.

To purchase your **Typing INSTRUCTOR** and other fine INDIVIDUAL Training programs, see your local IBM PC dealer or software retailer.

Other INDIVIDUAL Training™

The INSTRUCTOR	$44.95
Professor DOS	$59.95
Professor Pixel	$59.95
Tutorial Set	$94.95

Individual SOFTWARE INCORPORATED

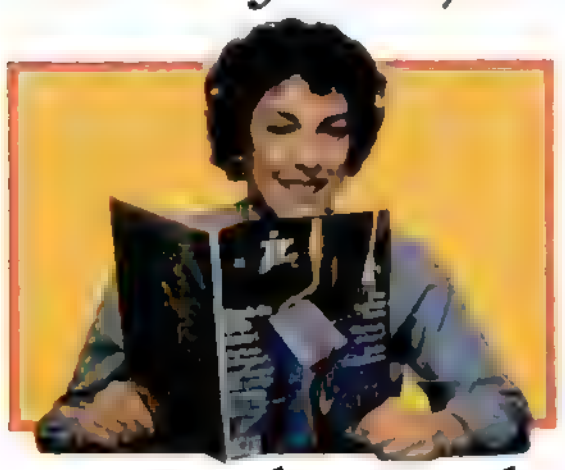
Individual Software, Inc.
1163-I Chess Drive
Foster City, CA 94404

Dealer and Phone Inquiries Welcome.
(415) 341-6116

Requires an IBM PC, PC XT, PCjr or IBM Compatible with 128k memory, DOS, one double-sided diskette drive and a color or monochrome display.

CIRCLE 109 ON READER SERVICE CARD

jr. WILL HELP YOU...Mind your business...Computerize your office...Buy a printer...Turn your PCjr into a word processor...**Learn** American History...Talk to your sales rep in Des Moines via CRT about his new sales quota...**Access** Dow Jones, The Source, Compu-serve and other public networks...Be your own bank teller...Write The Great American Novel...Purchase the right monitor..."**Cluster**" your PCjr. with a PCXT...Go on a diet that works (?) (!) ...Study Euclidean theory...**Prepare** for your visit to the IRS...Balance your checkbook...Teach your PCjr to sing in harmony...Fight off invading aliens during your lunch hour...**Computerize** your patient profiles...**Track** last month's inventory of steel ball bearings...Plan your vacation...**Find** PC software that's interchangeable with your PCjr...List your tax exempt expenses for the year...**Project** the amount of oil you will use in your furnace...Decipher your phone bill...Outline the itinerary of your cross-country business trip... **Organize** a little league...Discover when Venus and Mars are closest to the sun...Turn your PCjr into a Picasso or Van Gogh... Save money when buying new peripherals for your PCjr... **Manage** your database with dBase II...Catalog-shop with Compu-Card...Write memos...**Upgrade** your system...Cure insomnia with a new game you can play at midnight...Make calculus as easy as 1, 2, 3...Create bar charts to tell a story...**Expand** your system with two disk





drives...Organize your library...Set up a national sales meeting...**Review** the newest product releases from your living room...Improve your business . . . **Add** animation and sound to your PCjr...Get better grades in school...Write papers with no spelling errors...**Evaluate** new printers...Play challenging new games...Change operating systems...**Create** personalized stationery...Give pre-schoolers a head-start in computer learning...Eat, swing, jump, punch and blast better with winning game tips ...Choose a computer camp...**Balance** home expenses. MAKE YOUR PCjr YOUR MOST IMPORTANT TOOL!



SUBSCRIBE TO *PCjr.*—We'll help you mind your business and make computing entertaining, educational *and* functional!



PCjr. P.O. Box 2450, Boulder, Colorado 80322

YES! I want to subscribe to *PCjr.* for:

☐ One year (12 issues for $14.97. I SAVE 40%!)
☐ Two years for $27.97. I SAVE 44%!
☐ Three years for $38.97. I SAVE 48%!

Savings based on full one-year subscription price of $24.97.

Mr./Mrs./Ms. _____
print full name
PJAH542

Company _____

Address _____

City _____ State _____ Zip _____

Check one: ☐ Payment enclosed ☐ Bill me later

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add $8 per year in Canada and all other foreign countries.
Please allow 30 to 60 days for delivery of first issue.

Outs

out the Qubie' 212A modems.

212E/1200 Includes: Standalone modem with cable (specify male or female), modular phone cable, and instruction manual. **$329.**



what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

Four Hearts

The heart of the Qubie' modems are four digital signal microprocessors. Two handle sending, and two do the receiving. Rather than attempt to filter all but the relevant tones used for modem communications, the microprocessors measure the tones digitally. This allows them to overcome line noise and static better than analog filter based modems.

Why Buy From Qubie'

Because you will get a product as good or better than any available, pay less for it, and get factory direct help if you need it. If at any time during the one year warranty period your modem should require service, we will fix it or replace it within 48 hours. Notice also there are no hidden charges in our prices. No extra for freight, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra. If you are like many who say, "Nah, it's too good to be true", just apply the acid test and find out. Then you will be asking yourself, "Why should I pay what these modems used to cost?"

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get anyone selling another modem to give you the same guarantee. Buy both, and return the one you don't like. We know which one you will keep.

IBM is a trademark of International Business Machines Corporation.
Crosstalk is a registered trademark of Microstuf Inc
PC-Talk III is a registered trademark of The Headlands Press Inc.

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

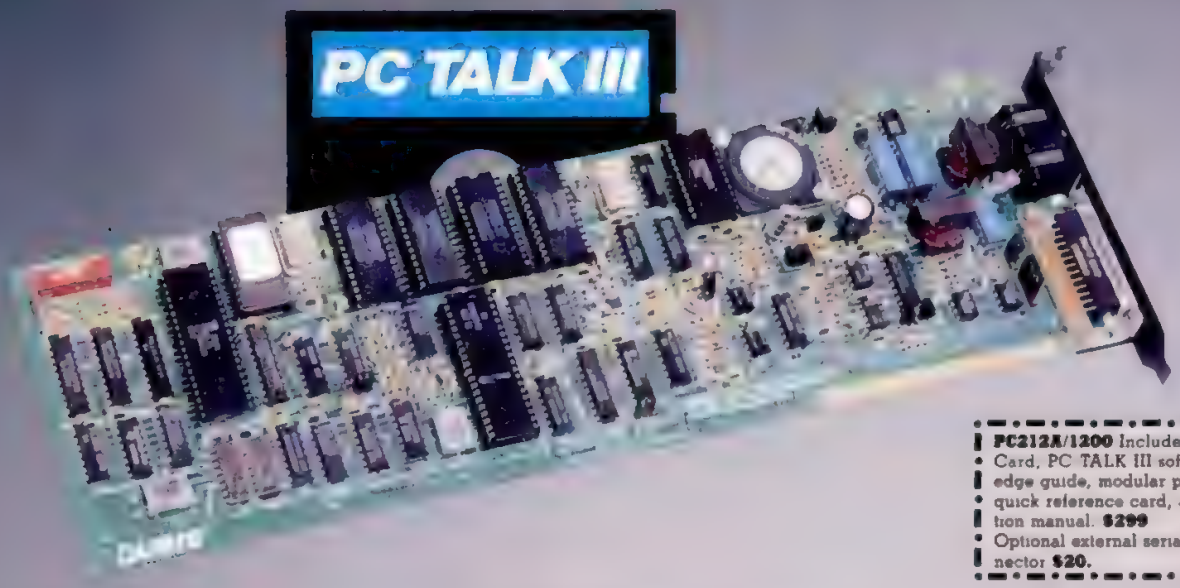
4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie' 1984

CIRCLE 333 ON READER SERVICE CARD

Thinking of buying a modem? Inside You owe it to yourself to check



PC212A/1200 Includes Modem Card, PC TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual. **$299**
Optional external serial port connector **$20.**

Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least $500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

In The Beginning

In September of 1983 we introduced the first 212A modem card for the IBM PC available for under $300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk,™ and Smartcom.™

We picked the best software package we could find based on it's ease of use and features, PC-TALK III. Our modem includes features the old industry standard missed out on. Like being able to fit in one slot in a Portable PC or PC/XT. Or an optional connector to use the modem's serial port when not using the modem. Of course the topper is the $299 price, hundreds less than the competition.

Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing



©1984 Cosmos Inc.

How long is an idea?

With Revelation® by Cosmos, it won't matter. Our variable length structure lets you think long or short without worrying about needing disk space you don't have, or squandering space you can't afford. Think of it. Relational Data Base Management Software that saves up to 40% of your PC's disk space.

As a powerful, enhanced version of the PICK™ Operating System, Revelation uses plain English to create files, menus, entry screens, process information and generate reports. Plus, you can build, customize and update your data base application without being an experienced programmer.

When you introduce your IBM® PC or compatible to Revelation, you'll see it change into a friendly brute that can communicate with other computers. Also featured is a hybrid full-structured programming language with an interactive debugging tool for serious development work.

Besides bringing the power, speed and flexibility of a minicomputer to your PC, Revelation works with MS/DOS™ so you can use all the popular microcomputer software packages with the applications you develop.

Indeed, Revelation is easy to get along with. A veritable gentle giant. But, you need to know more before you decide to buy what may become your most valuable business tool. So call us at (206) 824-9942 and let us arrange for you to see what we've got here.

MS/DOS™ of Microsoft Corp. IBM PC Registered TM of International Business Machines Corp. PICK Operating System™ of PICK SYSTEMS.

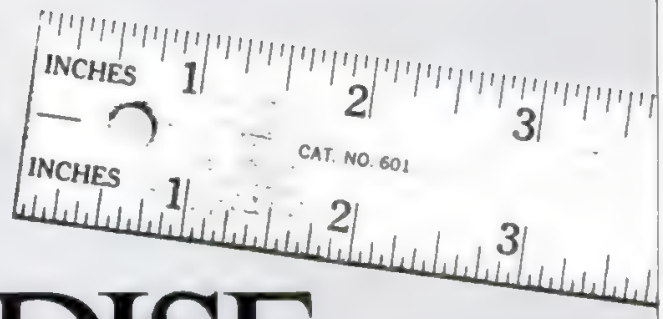
COSMOS™

Cosmos Inc. 19530 Pacific Highway S. Seattle, WA 98188, (206) 824-9942

CIRCLE 152 ON READER SERVICE CARD

You'll be sorry

if you buy an IBM® PC multifunction or graphics board before August 17.



PARADISE

SYSTEMS, INC

IBM is a registered trademark of International Business Machines Corporation, Inc.

CIRCLE 484 ON READER SERVICE CARD

Copyrighted material

It all adds up...

AST RESEARCH

MEGA PLUS II

64K, C, S,	$309.00
64K, C, 2S,	$349.00
64K C S P	$349.00
64K, C, S, P, GP,	$389.00

COMBO PLUS II

64K, C, S, P,	$279.00

I/O-PLUS II

C, S,	$139.00
C, 2S,	$169.00
C, S, P,	$169.00
C, S, P, G,	$199.00

SIXPAKPLUS

64K, C, S, P,	$279.00
64K, C, S, P, G,	$339.00

MAIN FRAME

AST 5251	$699.00
AST SNA	$699.00
AST BSC	$699.00
AST-3870	$749.00

MONOGRAPH PLUS

Video Board	CALL

QUADRAM

QUADLINK

64K Computer (Apple)	$479.00

QUADBOARD

64K, C, S, P,	$309.00

NEW EXPANDED QUADBOARD

64K, C, S, P, G,	$319.00

QUADBOARD II

64K C 2S	$309.00

QUAD 512 + S7

64K, S,	$259.00

QUADCOLOR

Quadcolor I	$239.00
Quadcolor II (640 x 200)	$449.00
Upgrade I II	$299.00

QUADDISK

6, 12, 20, 27, 72 Meg	starting at $1799

QUAD I/O

C, S, P, G,	$199.00

CHRONOGRAPH

Clock/Calendar	$89.99

PARALLEL BOARD

Printer Interface w/8' Cable	$89.99

QUADJET

QJ9000 Ink Jet Printer	$749.00

MICROFAZER

Call for Configurations P/P, P/S, S/S, S/P Starting at	$159.00

EFAZER

Epson Internal Buffers

8K	$69.99
64K	$149.00

AMDEK

MAI	$509.00

HERCULES

Monochrome Graphics	$399.00

EAGLE

PC Color Card	$229.00

PARADISE

Multi-Display Card	$449.00

TAC

IRMA 3270	$1049.00

PC PLUS PRODUCTS

Plantronics Color Plus	$469.00

KOALA

Koala Pad w/Micro Painter	$95.99

MICROSOFT

Multi-Tool Word w/Mouse	$299.00

MODEMS

ANCHOR

Volksmodem	$59.99
Mark VI	$169.00
Mark XII	$299.00

HAYES

300	$209.00
1200B	$449.00
1200	$499.00
SmartCom II	$75.99
Chronograph	$199.00

NOVATION

J Cat	$99.99
PC Cat 1 2 3	$399.00
Smart Cat 103	$189.00
Smart Cat 103/212	$439.00

MICROSTUF

Crosstalk XVI	$105.00
Remote	$99.99

MONITORS

AMDEK

300G	$159.00
300A	$169.00
310A	$189.00
Color II Plus RGB	$399.00
Color III RGB	$329.00
Color 4 TTBM RGB	$419.00

BMC

1201	$88.99
1201 Plus	$98.99
9191 Color Plus	$249.00

NEC

JB 1201 Green	$149.00
JB 1205 Amber	$159.00
JC 1215 Color	$269.00
JC 1216 RGB	$429.00

PRINCETON GRAPHICS

Max-12 Mono	$199.00
HX 12 RGB	$529.00

QUADRAM

8400 RGB	$529.00

TAXAN

100G Green	$129.00
100A Amber	$135.00
210 RGV	$299.00
420 Hi Res RGB	$489.00

ZENITH

ZVM 123G Green	$99.99
ZVM 122 Amber	$199.99
ZVM 123 Green	$89.99
ZVM 124 IBM Amber	$149.00
ZVM 131 Color	$309.00
ZVM 133 RGB	$429.00
ZVM 136 RGB/Composite	$469.00

DISK DRIVES

TANDON

5¼" 320K TM 100-2	$219.00

PERCOM HARD DRIVES

5 Meg w/Controller	$1049.00
10 Meg w/Controller	$1349.00
20 Meg w/Controller	$1899.00

PRINTERS

BMC

BX 80	$269.00
401	$589.00

C.ITOH

8510P	$379.00
A10P	$569.00
F10 40P	$999.00
F10 55P	$1349.00

COMREX

Comwriter II	$469.00

DAISYWRITER

2000	$999.00

DIABLO

620	$949.00
630	$1749.00

EPSON

RX80 RX80FT RX100	CALL
FX80 FX100	CALL
LQ 1500	CALL

IDS

Prism 80 132	CALL

JUKI

6100	$499.00

MANNESMANN TALLY

Spirit 80	$319.00
160I	$599.00
180L	$849.00

NEC

8023	$389.00
8025	$669.00
2050	$899.00
3550	$1669.00
7730	$1799.00

OKIDATA

82 83 84	...CALL
92, 93 2350, 2410	CALL

OLYMPIA

Compact 2	$479.00
Compact RO	$509.00
ESW 3000	$1449.00

SILVER REED

500	$469.00
550	$579.00
770	$899.00

SMITH CORONA

TP 1000	$399.00

STAR GEMINI

10X	$299.00
15X	$399.00
Radix 10	$599.00
Radix 15	$699.00

TOSHIBA

1340	$869.00
1351	$1699.00

TRANSTAR

120P	$499.00
130P	$689.00
315 Color	$499.00

COMPUTER MAIL ORDER

west
800-648-3311
In NV call (702)588-5654, Dept. 130
Order Status Number 588-5654
P O Box 6689
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call
(416)828-0866, Dept 130
Order Status Number 828-0866
2505 Dunwin Drive, Unit 3B
Mississauga, Ontario, Canada L5L1T1

east
800-233-8950
In PA call (717)327-9575, Dept 130
Order Status Number 327-9576
Customer Service Number 327-1450
477 E 3rd St., Williamsport, PA 17701

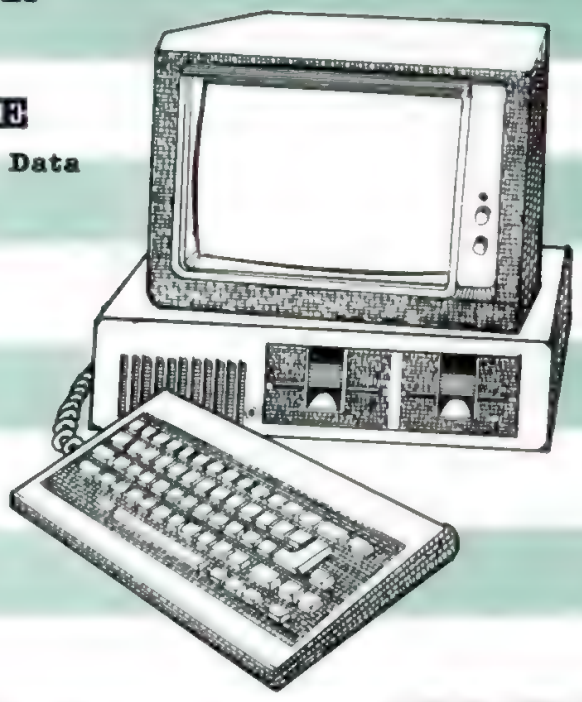
No risk, no deposit on C O D orders and no waiting period for certified checks or money orders Add 3% (minimum $5) shipping and handling on all orders Larger shipments may require additional charges NV and PA residents add sales tax All items subject to availability and price change Call today for our catalog.

Copyrighted material

the best prices

CALL FOR YOUR FAVORITE PC/COMPATIBLE

Sanyo **Columbia Data**
TeleVideo **Compaq**
Zenith **Eagle**



ASHTON-TATE

dBASE II	$339.00
dBase III	$449.00
Friday	$185.00
Bottom Line Strategist	$269.00
Financial Planner	$419.00
Framework	CALL

BenchMark

Word Processing	$199.00
Mailing List	$99.99

CDEX

Training Programs	each $49.99

CONTINENTAL SOFTWARE

Home Accountant Plus	$88.99
1st Class Mail	$79.99

FOX & GELLER

QZZ	$289.00
Grafox	$199.00
dUtil	$69.99
dGraph	$199.00
Quickcode	$199.00

IMSI

4 Point Graphics	$139.00
Bisybase	$189.00

IUS

EasyFiler	$229.00
EasyPlanner	$159.00
EasyWriter	$119.00
EasyWriter II (spell/write/mail)	$249.00

LEXISOFT

Spell Check	$199.00
Spell Binder	$259.00

LIFETREE SOFTWARE

Volkswriter	$115.00
Volkswriter Deluxe	$209.00

LOTUS

1 2 3	$339.00
Symphony	$549.00

MICROPRO

InfoStar	$299.00
DataStar	$179.00
Word Plus PC/The Boss	$349.00
WordStar	$299.00
MailMerge	$159.00
WordStar/MailMerge	$349.00
PRO PACK	$379.00
SpellStar	$159.00
CalcStar	$99.99

MICROSOFT

Multi Plan	$159.00

SPINNAKER

Fraction Fever	$29.99
Story Machine	$29.99
KinderComp	$24.99
Facemaker	$29.99
Hey Diddle Diddle	$24.99
Rhymes & Riddles	$24.99
Snooper Troops 1 or 2	$29.99
Search of Most Amazing Thing	$29.99

INFOCOM

Witness	$32.995
Enchanter	$32.99
Planetfall	$32.99
Suspended	$32.99
Starcross	$29.99
Zork 1, 2, or 3	$29.99
Infidel	$32.99

CENTRAL POINT

PC Copy II	$32.99

DISKETTES

MAXELL

MD 1	$24.99
MD 2	$34.99

VERBATIM

SS DD	Value Life	$26.99
DS DD	Value Life	$36.99

ELEPHANT

SS SD	$18.49
SS DL	$21.99
DS DD	$26.99

MULTIMATE INT.

Multi Mate	$319.00

PEACHTREE SOFTWARE

Peachtext 5000	$229.00
Peachpack (GL/AP/AR	$219.00

PERFECT SOFTWARE

PerfectFiler	$239.00
FinalWord	$192.00
PerfectWriter	$199.00
PerfectSpeller	$119.00
PerfectCalc	$119.00

PFS

File	$89.99
Report	$79.99
Graph	$89.99
Write	$89.99

SOFTWARE ARTS

TK Solver	$189.00

SYNAPSE

File Manager Plus	$89.99

VISICORP

VisiCalc 4	$159.00
VisiWord Spell	$199.00
VisiFile	$199.00
VisiSchedule	$199.00
Desktop Plan	$199.00
Business Forecast Model	$75.99
VisiTutor Word	$59.99
Visi On Calc	$249.00
Visi On Graph	$129.00
Visi On Word	$249.00
Visi On Mouse	$159.00

COMPUTER MAIL ORDER

west
800-648-3311
In NV call (702)588-5654, Dept. 130
Order Status Number 588 5654
P O Box 6689
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call
(416)828 0866, Dept 130
Order Status Number 828 0866
2505 Dunwin Drive, Unit 3B
Mississauga, Ontario, Canada L5L1T1

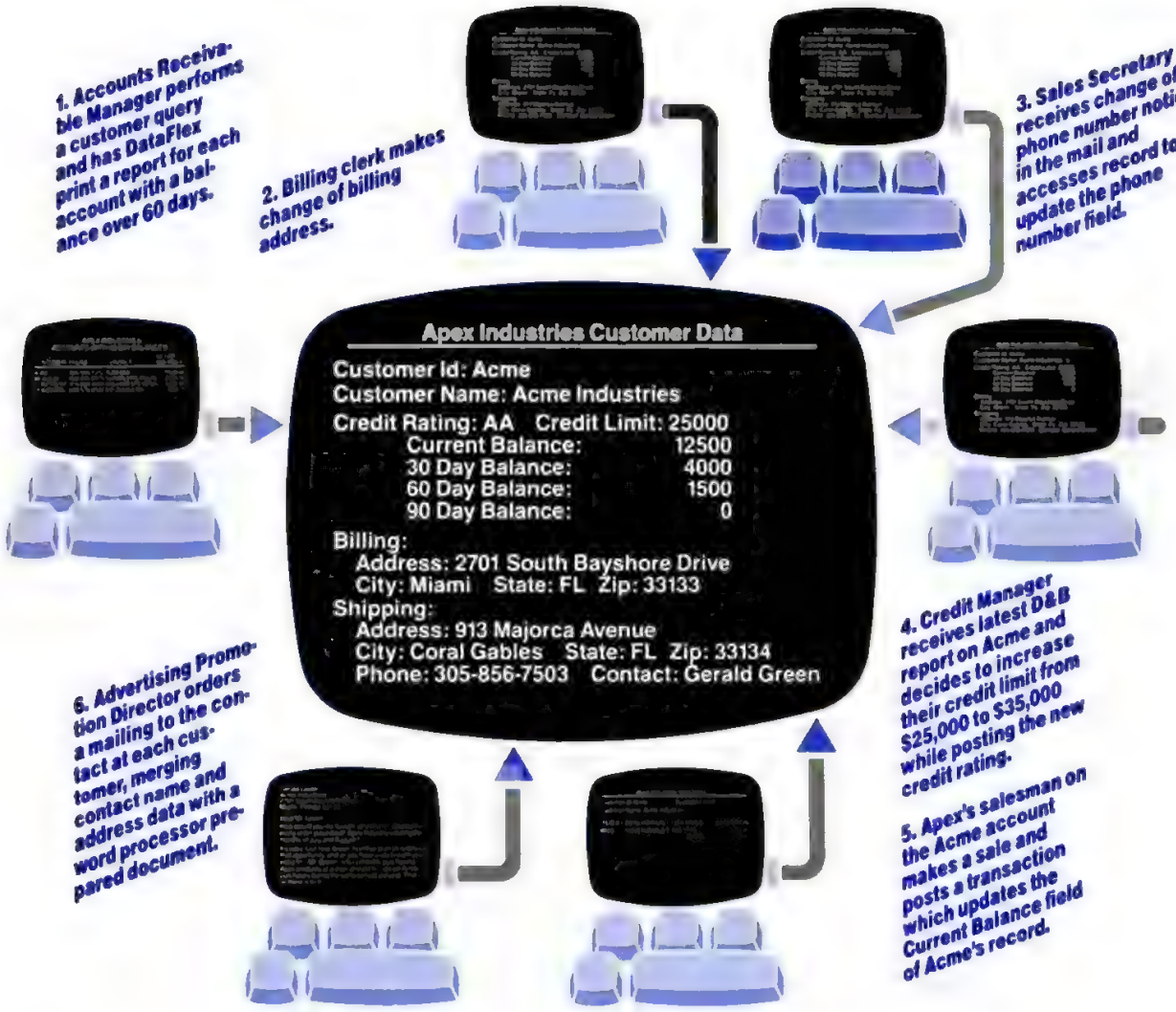
east
800-233-8950
In PA call (717)327-9575, Dept. 130
Order Status Number 327 9576
Customer Service Number 327-1450
477 E. 3rd St., Williamsport, PA 17701

CANADIAN ORDERS All prices are subject to shipping, tax and currency fluctuations Call for exact pricing in Canada INTERNATIONAL ORDERS All orders placed with U S offices for delivery outside the Continental United States must be pre-paid by certified check only Include 3% (minimum $5) shipping and handling EDUCATIONAL DISCOUNTS Additional discounts are available to qualified Educational Institutions APO & FPO Add 3% (minimum $5) shipping and handling

CIRCLE 183 ON READER SERVICE CARD

ALL AT ONCE!

AND NEVER A "LOCKED OUT" USER!



DataFlex is the only application development database which ***automatically*** gives you true multi-user capabilities. Other systems can lock you out of records or entire files for the full time they are being used by someone else. DataFlex, however, locks only the data being changed, and ***only*** during the micro-seconds it takes to actually write it to the file! The updated record is then immediately available. The number of users who can access, and change, records at the same time is limited only by the number of terminals on your system or network. Call or write today for all the details on DataFlex...the true multi-user database.

DATAFLEX

8525 SW 129 Terrace, Miami, FL 33156 (305) 238-0012
Telex 469021 DATA ACCESS CI

Compatible with CP/M-80, MSDOS networks, MP/M-86, Novell Sharenet, PC-Net, DMS Hi-net, TurboDOS multi-user, Molecular N-Star, Televideo MmmOST, Action DPC/OS, IBM PC w/Corvus, OMNINET, 3Com EtherSeries and Micromation M/NET.
MSDOS is a trademark of Microsoft. CP/M and MP/M are trademarks of Digital Research.

CIRCLE 108 ON READER SERVICE CARD

DIAMOND DELIVERS!

The Total Solution
Full Service • Full Support
Low, Low Prices

This Month's Packaged Specials

Wordstar Pro Pack/ Lotus 123	$689	Multimate/Lotus 123	$619
Wordstar Pro Pack/ Lotus 123/dBase II	$1039	Microsoft Word/ Mailmerge/Mouse	$319
dBase II/Quickcode	$569	Mailmerge/Correctstar/ Star Index	$189
Wordstar/Mailmerge/ Correctstar/Star Index	$369	Easywriter II /Speller II / Mailer II	$199

dBase II	$call	Wordstar	$245	R:Base 4000	$329
Volkswriter Dlx	$179	Lotus 123	$call	Multiplan	$129
Supercalc 3	$219	Multimate	$299	Symphony	$call

	LIST	SALE
Alpha Software*		
APPLE-IBM CONNECTION	$250	$139
DATA BASE MANAGER II	$295	$195
Ashton Tate*		
FRIDAY	$695	$349
Condor*		
CONDOR 3	$150	$ 99
Continental*	$195	$125
HOME ACCOUNTANT		
ULTRAFILE	$195	$105
Microstuf*		
CROSSTALK XVI	$400	$249
Digital Research*	$360	$229
PASCAL MT + 86	$200	$135
CONCURRENT CP/M 86	$150	$109
C BASIC 86	$ 60	$ 39
PERSONAL BASIC	$400	$249
CP/M 86	$500	$329
ACCESS MGR	$ 95	$ 69
DISPLAY MGR		$call
DR LOGO		
PC DOS LANGUAGES	$350	$265
Dow Jones*	$300	$219
MARKET ANALYZER		
MARKET MANAGER	$195	$119
Financ'ne*	$150	$109
FINANCIER II		
TAX SERIES	$295	$189
Fox & Geller*	$295	$199
QUICKCODE	$295	$199
GRAFOX	$ 99	$ 59
dGRAPH		
dUTL		
Harvard Software*		
HARVARD PROJECT MANAGER	$395	$279

	LIST	SALE
Informat on Unlimited*		
EASYSPELLER II	$100	$ 59
EASYMAILER	$100	$ 59
GENERAL LEDGER	$595	$299
ACCOUNTS PAYABLE	$595	$299
ACCOUNTS RECEIVABLE	$595	$299
INVENTORY CONTROL	$595	$299
PAYROLL	$745	$379
Lexisoft*	$495	$275
SPELLBINDER	$595	$319
Lifeboat*		
LATTICE C COMPILER	$195	$119
Lifetree*		
VOLKSWRITER	$500	$329
Micro Data Base*		
KNOWLEDGEMAN	$250	$135
Micrpro*	$495	$259
MAILMERGE	$195	$ 99
INFOSTAR	$695	$309
CORRECTSTAR	$595	$299
PLANSTAR	$195	$ 99
INFOSTAR/STARBURST	$200	$ 99
STARBURST		
SUPERSORT II	$195	$139
Microsoft*	$375	$249
MOUSE	$100	$ 69
WORD/MAILMERGE	$150	$ 99
MULTITOOL FINANCIAL	$300	$209
MULTITOOL BUDGET	$350	$239
PASCAL COMPILER	$500	$349
FORTRAN		
C COMPILER	$165	$109
Monogram*		
DOLLARS & SENSE	$495	$329
Professional Software*		
WORD PLUS W/BOSS		

	LIST	SALE
Rosesoft*		
PROKEY	$129	$ 89
Software Publishing*		
PFS REPORT	$125	$ 85
PFS FILE	$140	$ 95
PFS GRAPH	$140	$ 95
PFS WRITE	$140	$ 95
Sorcim*	$295	$159
SUPERCALC 2	$295	$159
SUPERWRITER		
Supersoft*	$425	$299
FORTRAN		
Visicorp*	$375	$269
VISIWORD	$250	$169
VISICALC IV		
AST Research*	$395	$269
6 PAK PLUS-64K		$call
ALL OTHER AST PRODUCTS		
Anchor Automation*	$399	$269
SIGNALMAN MARK XII		
Hayes*	$699	$499
SMARTMODEM 1200	$599	$429
SMARTMODEM 1200B		
Quadram*	$680	$489
QUADLINK	$295	$219
QUADCOLOR	$395	$269
64K EXPANDABLE BOARD	$595	$409
256K	$395	$269
QUADBOARD EXP. TO 384K		
Hercules*	$499	$355
GRAPHICS CARD		$ 57
MEMORY CHIPS (64K)		

TO ORDER
CALL TOLL-FREE
1-800-227-0545
Software Specialists For The IBM PC

- Special Corporate Incentives
- Cumulative/Quantity Discounts
- Same Day Shipment
- Overnight Delivery Available
- Purchase Orders Accepted From Qualified Organizations
- IBM,* CPM,* Apple* formats
- Expert Technical Assistance
- Full Product Guarantees
- Visa, M/C, Amer. Exp.
- Free UPS Surface w/Ppd Check

Diamond Software Supply

484 Lake Park Ave., Suite 123, Oakland, CA 94610

For price quotes, information or in California call 1-415-893-7676. We credit your order for the call. **Technical Department** (415) 893-7678. International Telex 338139 (attn. 149)

IBM is a trademark of International Business Machines. CPM is a trademark of Digital Research. Apple is a trademark of Apple Computer Inc.

CIRCLE 189 ON READER SERVICE CARD

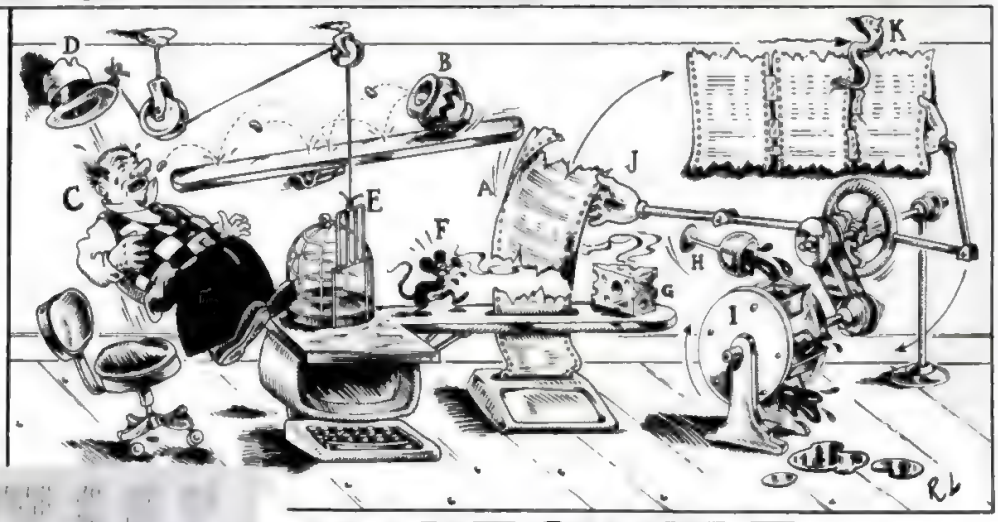
SIMPLIFIED SPREADSHEET ASSEMBLY

RISING SPREADSHEET (A) KNOCKS MEXICAN JUMPING BEANS (B) INTO MOUTH OF NEUROTIC MAN (C) WHO IS SO DISCOMBOBULATED THAT HIS HAIR STANDS ON END, DISLODGING HAT (D) WHICH OPENS CAGE (E) AND RELEASES EPICUREAN MOUSE (F).

MOUSE, INSPIRED BY SCENT OF PERFECTLY AGED CAMEMBERT CHEESE, GNAWS THROUGH SPREADSHEET, ONLY TO DISCOVER HE HAS BEEN FOOLED BY AROMA OF OVER-RIPE GORGONZOLA (G).

IN A FIT OF PIQUE HE SPILLS VINTAGE WINE (H) INTO WATER-WHEEL (I) WHICH TURNS PULLEY THAT CAUSES GLOVE (J) TO GRASP SPREADSHEET AND MOVE IT TO TAPING AREA.

SHEET IS TAPED SECURELY IN PLACE BY TRAINED ADHESIVE TAPE WORM (K).





MADE SIMPLE.

Now you can save time, aggravation, adhesive tape, and Gorgonzola cheese by following one simple direction—Sideways. It's the unique software program that lets you output all the spreadsheet columns you need, all on one continuous page, all with one print command—and all for only $60!

With Sideways on your side, no spreadsheet you invent with Lotus 1-2-3,™ VisiCalc,® Multiplan,™ or SuperCalc™ is too wide! And it's just as powerful an ally when you're creating far-into-the-future schedules and pert charts with your word processor. In fact, for any wide text file, for dozens of uses, the way to go is Sideways.

The experts agree. *PC* Magazine, for example, writes: "If you've got the need, Sideways has the solution." And *PC World* calls Sideways "nifty . . . . an easy to use program that does what it claims."

You can go Sideways today with an IBM® PC and an IBM,® Epson, Okidata, Prism,™ or Prowriter™ printer. Ask for Sideways at your local ComputerLand® or other leading computer stores. Or mail a $60 check to Funk Software, P.O. Box 1290, Cambridge, MA 02238. (617) 497-6339. MC/Visa accepted. Send no Mexican jumping beans, please.

SIDEWAYS™
FOR EASY-READING HARD COPY

CIRCLE 306 ON READER SERVICE CARD

HIGH TECHNOLOGY AT AFFORDABLE PRICES

Dot Matrix Printers

C. Itoh Prowriter (8510)	$ 369.88
C. Itoh Prowriter-2, (136 col)	589.88
C. Itoh Prowriter BPI	439.88
C. Itoh HotDot	509.88
C. Itoh HotDot-2 (136 col)	729.88
Epson RX/FX/LQ Series	CALL
Inforunner Riteman	309.88
Mannesmann Tally 160-L	629.88
Mannesmann Tally 180-L	879.88
Mannesmann Tally Spirit-80	329.88
Okidata Microline 82A/83A	CALL
Okidata Microline 84 Step II	1059.88
Okidata Microline 92	469.88
Okidata Microline 92 w/graphic compatibility with IBM-PC	469.88
Okidata Microline 93	769.88
Plug-n-Play ROMs	CALL
Star Micronics Gemini 10X	299.88
Star Micronics Gemini 15X	429.88
Star Micronics Delta 10	439.88
Star Micronics Delta 15	589.88
Star Micronics Radix 10/15	CALL
Toshiba P-1351	1689.88

Letter-Quality Printers

C. Itoh A-10 Starwriter (18 cps)	$ 549.88
C. Itoh F-10 Starwriter (40 cps)	1079.88
C. Itoh F-10 Printmaster (55 cps)	1379.88
NEC 2010/2030 (18 cps)	749.88
NEC 2050 for IBM-PC (18 cps)	899.88
NEC 3530 (33 cps)	1429.88
NEC 3550 for IBM-PC (33 cps)	1779.88
NEC 7730 (50 cps)	1939.88
Qume Sprint 11/40/55	CALL
Qume LetterPro 20	709.88
Silver Reed EXP-770 (25 cps)	979.88
Silver Reed EXP-550 (17 cps)	559.88
Silver Reed EXP-500 (12 cps)	439.88
Smith Corona Memory Correct III Messenger (12 cps) w/interface module	589.88
Star Micronics PowerType (18 cps)	CALL

Modems

Hayes Smartmodem 300	239.88
Hayes Smartmodem 1200	559.88
Hayes Smartmodem 1200B	479.88
Novation SmartCat 103, 300bd	CALL
Novation SmartCat 212, 1200bd	CALL
Novation Access 1-2-3	CALL
USR Password, 1200 baud	369.88
USR Password, 300 baud	159.88
USR PC 1200 baud Modem/Multifunction board w/64-256K, clock, parallel port & Telpac software	CALL

Monitors

Amdek 300G (green)	$ 144.88
Amdek 300A (amber)	159.88
Amdek 310A (TTL amber)	179.88
NEC JB-1205M (amber/green)	159.88
Princeton Graphics HX-12 (690H x 240V RGB Monitor w/cable)	509.88
Princeton Graphics Max-12 (Amber Monochrome/TTL w/cable)	199.88
Quadram QuadChrome (690H x 240V RGB Monitor w/cable)	529.88
Roland DG-121 (green/amber)	149.88
Roland DG-122 (green or amber monochrome/TTL w/cable)	179.88

IBM-PC Peripherals

64K Memory (4164/200ns) 9/pkg	$ 79.88
Alloy 52 MB Disk/Tape System	$CALL
Alloy PC Backup System	CALL
AST 64K MegaPlus II	289.88
AST 256K MegaPlus II	479.88
AST Megaplus II optional Parallel port, 2nd RS-232C port or Game Port	39.88
AST 256K MegaPak	CALL
AST SixPak Plus 64K	299.88
AST SixPak Plus 256K	519.88
AST SixPak Plus 384K	639.88
Columbia Computer Systems	CALL
Hercules Graphics Card	379.88
Keytronics 5151 keyboard	CALL
Microsoft Mouse (parallel)	149.88
Mouse Systems PC-Mouse	219.88
Paradise MultiDisplay	479.88
NEW Quadram 384K Quadboards	CALL
Quadram Quad 512 + (64K)	239.88
Quadram Quad 512 + (512K)	689.88
Quadram Memory Boards	CALL
Quadram QuadColor-1	219.88
Quadram QuadColor-2	229.88
Quadram QuadVue (monochrome)	CALL
Quadram QuadDisk	CALL
Quadram Parallel Card, RS-232C Card or Clock/Calendar Card	79.88
Quadram QuadLink	509.88
Quadram QuadLink (Columbia)	539.88
Quadram QuadLink (Compaq)	539.88
Tandon TM 100-2 DSDD	229.88
Titan Cygnus I/O (clock/parallel)	149.88
Titan Cygnus I/O (clock/RS-232)	169.88
Titan MultiFunction Board	CALL
TG Joystick	59.88

Accessories

Printer Cables	$29.88
80 Column Printer Stand (metal)	39.88
132 Column Printer Stand (metal)	49.88
2-Way Printer Switch Box	109.88
4-Way Printer Switch Box	159.88
DSDD Diskettes	CALL
Curtis Monitor Stand w/cables	119.88
Curtis Monitor Stand w/o cables	64.88
Tilt/Swivel Monitor Stand	39.88
Curtis System Stand	24.88
EPD Lemon/Lime/Orange/Peach	CALL
Flip-n-File Disk Boxes	CALL
Kensington PC-Saver	45.88
Kensington Micro-Saver	59.88
Quadram Microfazer Print Buffers	CALL
Trace Sound Trap (80 col)	129.88
Trace Sound Trap (132 col)	189.88

ADVANCED LOGIC SYSTEMS • ALLOY • AMDEK • ANADEX • AST • CCS • CARDCO • C ITOH • COMREX • COLUMBIA DATA PRODUCTS
CURTIS MANUFACTURING • DATA PRODUCTS (IDS) • DIABLO • DTC • EAGLE COMPUTER • EASIFEED • EPD • EPSON • FRANKLIN COMPUTER
HAYES MICROCOMPUTER PRODUCTS • HERCULES COMPUTER TECHNOLOGY • INFORUNNER • INTERACTIVE STRUCTURES • JMM
JUKI • KENSINGTON MICROWARE • LEADING EDGE • LQ • MANNESMAN TALLY • MA SYSTEMS • MICROSOFT • MILFORD NULL MODEM
MOUSE SYSTEMS • NOVATION • NEC • OKIDATA • ORANGE MICRO • PARADISE SYSTEMS • PERFECT DATA • PRINCETON GRAPHICS
QUADRAM • QUME • QCS • RANA SYSTEMS • ROLAND DG • SILVER REED • SMITH-CORONA • STAR MICRONICS • TANDON • TECMAR
TITAN • TOSHIBA • USI • US ROBOTICS • VIDEX

The right place for the right price

If you live in the New England area (or plan to visit there), you should drop by our ***Discount Computer Store***. We're about one hour's drive from Boston, the ocean or the White Mountains. From Boston, just go up Route 3 to Nashua, NH, and take Exit 7W (Route 101A). We're 5.1 miles from that exit, in Amherst NH. Take the next right after you see the Dexter Shoe factory outlet store.

In fact, we're near a lot of New Hampshire's factory outlet stores, and with no sales tax you can save a bundle on computer equipment, shoes and whatever else strikes your fancy. We have several systems on display, as well as printers, modems and monitors, all at the same prices you see in our ads. And if you can't fit a purchase into your car, don't worry...we'll ship it free anywhere in the 48 contiguous states.

No matter where you live—Boston or San Francisco—You don't have to strike out into the wilderness to save money. Take a short drive or drop us a line for the best advice and price for IBM-PC peripherals.



TECHNICAL SALES DESK

(603) 881-9855

TOLL-FREE ORDER DESK

(800) 343-0726

Hours: 9:00 to 5:30 EST, Mon-Fri

- FREE UPS ground shipping on all orders over $50 (under $50 add $2.50 for handling)
- Shipments fully insured at no extra charge
- MasterCard, VISA, American Express, Diners Club & Carte Blanche credit cards accepted
- No surcharges on credit card
- Credit cards are not charged until your order is shipped from our warehouse
- CODs accepted up to $1000 (add $10 for COD handling). Payable with certified check, money order or cash.
- Full manufacturer's warranty on all products sold
- 1-year extended warranty service is now available for many products (just ask us)
- Sorry, no APO/FPO or foreign orders

AMERICAN EXPRESS

HIGH TECHNOLOGY AT AFFORDABLE PRICES

THE BOTTOM LINE

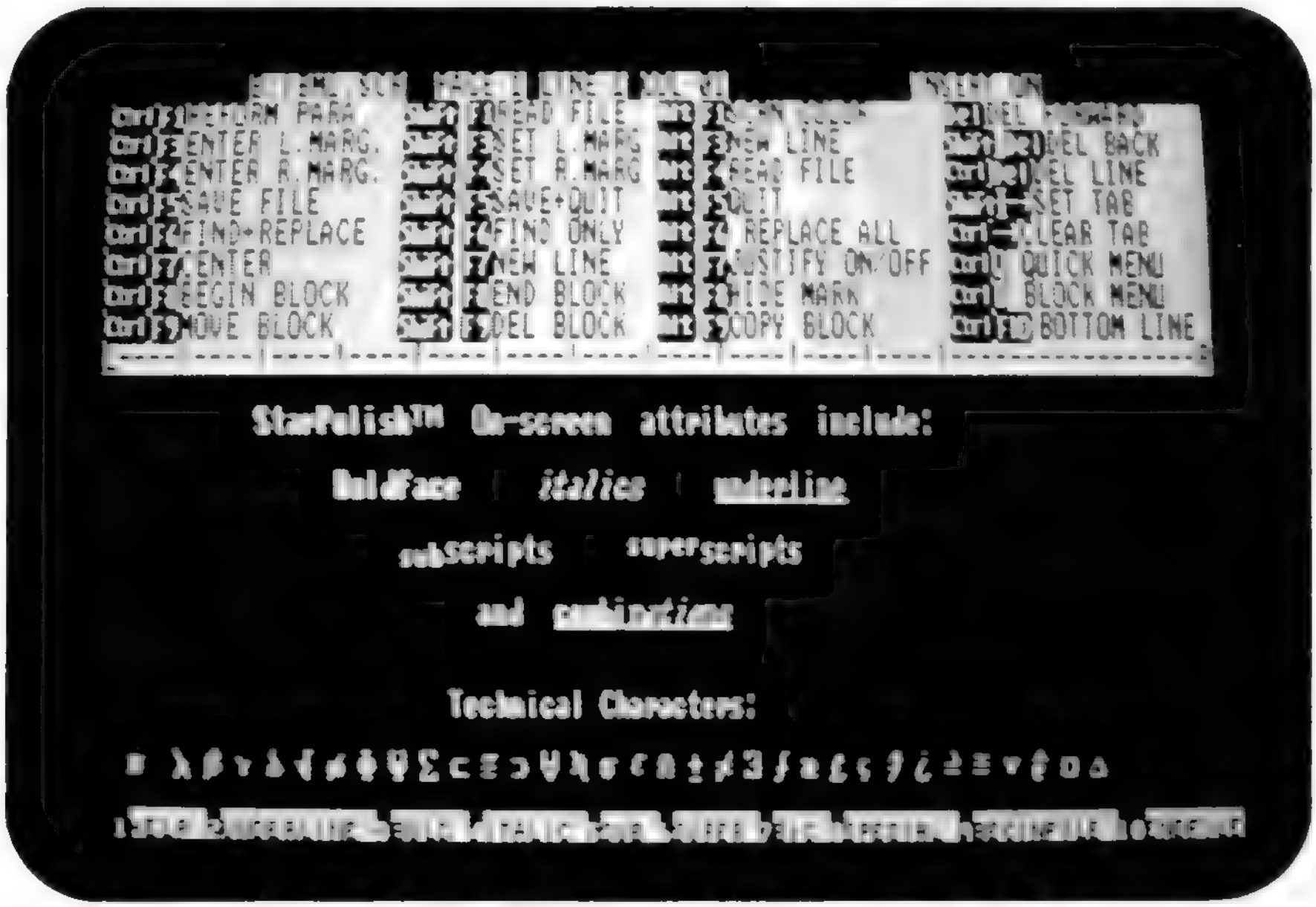
MasterCard VISA

MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

CIRCLE 213 ON READER SERVICE CARD

StarPolish™

Polished WordStar® is a Sight to Behold!



What You See is What You Get...and MORE

On-Screen Enhancements:

With Color Adaptor and Monitor:
- Bold, underline, sub and superscript, italic, and technical

With Monochrome Adaptor:
- Bold and underline. Others indicated on status line

Custom Level 3 Help Screen
- Replaces need for keyboard template for keystroke savings

WordStar Compatibility - No Retraining

Keystrokes
- User has option of keystroke saving techniques

Files
- Old WordStar files accessible
- Polished WordStar files accessible by standard WordStar

Utilities
- Use of MailMerge®, SpellStar®, StarIndex® is not affected

Printer Support Enhanced Too!

Get the most from your dot matrix or ink jet printer without worrying about an assembly language patch. A menu of popular printers gives you automatic installation of all features. A custom installation question/answer session is available for printers not on the menu.

Versions Now Available For:

IBM PC® and PC-XT®
PC Compatibles
Victor 9000®

$125.00

Md. Customers add 5% Sales Tax

MasterCard
VISA

We've made WordStar a lot more likeable!

StarPolish is a trademark of TDI Systems, Inc.
WordStar, MailMerge, SpellStar, StarIndex are registered trademarks of MicroPro International Corp.
IBM PC and PC-XT are registered trademarks of International Business Machines, Corp.
Victor 9000 is a registered trademark of Victor Technologies, Inc.

TDI SYSTEMS, INC.
620 Hungerford Drive
Suite 33
Rockville, Maryland 20850
(301) 340-8700

CIRCLE 382 ON READER SERVICE CARD

Softline

THE PROFESSIONAL'S CHOICE

WORD PROCESSING/ EDITORS

Easywriter II System (3 pak)	$219
Edix/Wordix	$269
Final Word	$189
Microsoft Word	$239
Microsoft Word/Mouse	$299
Multimate	$279
PeachText 5000	$219
Perfect Writer/Speller	$249
PFS: Write	$ 95
Samna Word II	$329
Select Word Processor	$199
Spellbinder	$249
SuperWriter	$179
Volkswriter Deluxe	$179
The Word Plus (Oasis)	$109
Word Perfect (SSI)	$Call
WordPlus-PC with The Boss	$329
WordStar	$239
WordStar Professional (WS/MM/SS/SI)	$359
WordStar Options Pak (MM/SS/SI)	$189

DATABASE SYSTEMS

Alpha Data Base Manager II	$179
Condor III	$329
dBase II	$369
DBplus	$ 89
Friday	$179
InfoStar	$269
Knowledgeman	$295
Perfect Filer	$159
Personal Pearl	$199
PFS: File/PFS: Report	$169
Powerbase	$289
QuickCode	$169
R:base 4000	$289
T/Maker III	$199
TIM IV	$269
Versaform	$249

SPREADSHEETS/ INTEGRATED PACKAGES

Framework	$Call
InteCalc	$189
Jack 2	$329
Lotus 1-2-3	$319
Multiplan	$135
Open Access	$399
Ovation	$Call
SuperCalc 3	$239
Symphony	$Call
TKI Solver	$289
VisiCalc IV	$159

PROJECT MANAGEMENT

Harvard Project Manager	$269
IntePert/Plan	$239
Scitor Project Scheduler	$229
VisiSchedule	$199

GRAPHICS/STATISTICS

Abstat	$279
BPS Business Graphics	$229
Chartman Combo (II&IV)	$349
Chartmaster	$259
dGraph	$189
Energraphics	$259
Fast Graphs	$199
Graphwriter Combo	$429
PC Draw	$289
PFS: Graph	$ 95
Statpac	$299

ACCOUNTING MODULES

Ask Micro Accounting	$299
BPI Accounting	$369
IUS EasyBusiness System	$319
MBA Accounting	$369
Open Systems Accounting	$459
Peachpak 4 (GL/AP/AR)	$239
Peachtree Accounting	$399
Real World Accounting	$469
Star Accounting Partner (GL/AP/AR/PAY)	$269

PROFESSIONAL DEVELOPMENT

Management Edge	$139
Think Tank	$179

HOME/PERSONAL FINANCE

Dollars and Sense	$119
Financier II	$119
Home Accountant Plus	$ 99
Tax Preparer 84	$189

LANGUAGES/UTILITIES

Access Manager	$239
Digital Research C Compiler	$219
Display Manager	$299
Microsoft C Compiler	$329
MS Basic Compiler	$249
MS Fortran	$239
Pascal MT+86	$249
Norton Utilities	$ 59

COMMUNICATIONS/ PRODUCTIVITY TOOLS

Crosstalk	$119
Memory Shift	$ 79
Move It	$109
Prokey 3.0	$ 95
Smartcom II	$109

HARDWARE PERIPHERALS*

AST Six Pack Plus (64k)	$269
Quadboard (Oki)	$209
Hayes 1200B with Smartcom	$399
Hayes Smartmodem 1200	$499
Hercules Graphics Board	$349
Epson FX-100 Printer	$Call
Comrex II Printer	$Call
C Itoh Prowriter	$Call
C Itoh Starwriter	$1199
Okidata 93A	$749
64K Memory	$ 55

*Call for shipping.

Lotus 1-2-3 $319	WordStar Professional $359
dBase III $CALL	R: base 4000 $289
Multi Mate $279	SuperCalc 3 $239
Word & Mouse $299	Microsoft C Compiler $329
PFS: File PFS: Report $169	Smartmodem 1200B $399
AST Six Pak Plus $269	Smartmodem 1200 $499

Corporate Accounts**—Join the roster of over 100 major corporations who have sampled our excellent pricing, reliable service and friendly support. **Call for details.

DISCOUNT COUPONS

With each order, we offer **discount coupons** worth up to **$10** on your next order.

FREE!

Diskette Library Case

. . . with your order. This attractive case protects, indexes and stores 10 diskettes for quick retrieval. Normally a $10 value, it is now available ***FREE*** to Softline customers



To Order call

1-800-221-1260

In New York State call **(212) 438-6057**

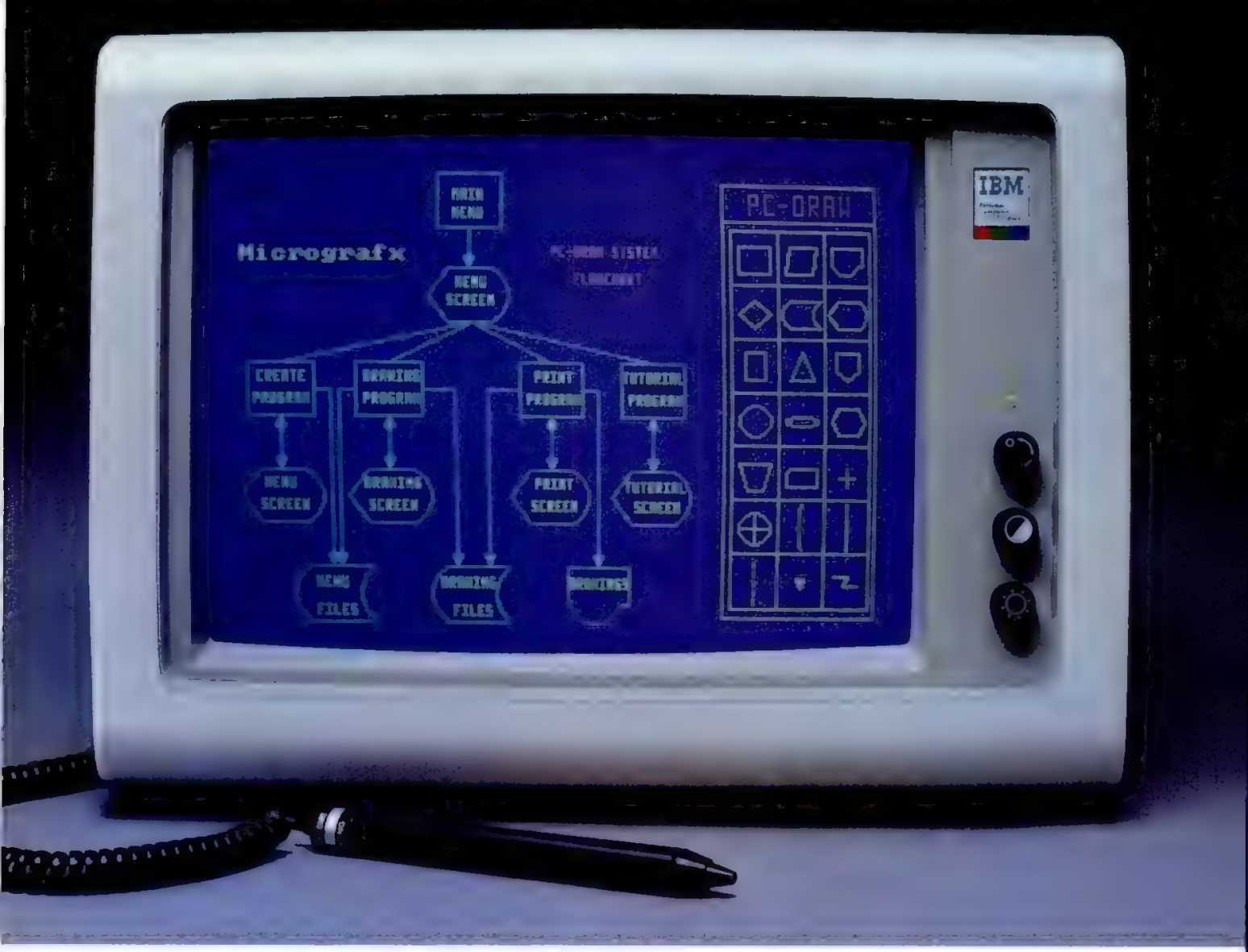
For technical support and information call (212) 438-6057

TERMS:
Checks—allow 14 days to clear. Credit processing—add 3%. COD orders—cash, M.O. or certified check—add $3.00. Shipping and handling UPS surface—add $3.00 per item (UPS Blue $6.00 per item). NY State Residents—add applicable sales tax. All prices subject to change

MasterCard VISA

Softline

Softline Corporation
3060 Bedford Ave., Brooklyn, N.Y. 11210
TELEX: 421047 ATLN UI



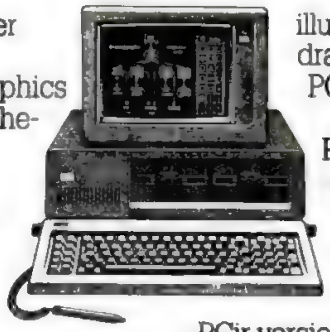
PC-Draw from Micrografx, the drawing system for your office or home.

Now, you can create diagrams, illustrations, charts and drawings on the IBM PC or XT™

And reproduce them all with your printer or plotter.

With this versatile, easy-to-use graphics program, you can produce diagrams, schematics, charts and drawings in virtually limitless varieties.

PC-Draw provides you with three symbol libraries (software design, electrical design, and alternate text), multiple text fonts and the capability to design your own symbols, with an extensive set of graphic functions provided for symbol manipulation. These functions include object scaling, rotation and placement. PC-Draw lets you unleash your creative energies in data processing design, floor plans and interior design, graphic illustrations, electrical design, and other drawing/drafting applications. And PC-Draw supports an optional light pen.



The PC-Draw system requires an IBM PC or XT™ with graphics monitor, graphics adapter, 128K of RAM and two diskette drives or one diskette drive and a hard disk.

PC-Draw: $395 (includes HP7470A / 7475A Plotter Support). Light Pen: $195. PCjr version: $195. Plotters and graphics boards at competitive prices. To order or for information call (214) 234-1769 or write Micrografx.

MICROGRAFX INC.

1701 N. Greenville Ave., Suite 703/Richardson, TX 75081

© 1984 Micrografx

CIRCLE 181 ON READER SERVICE CARD

Year of the Onion

The personal computer marketplace is certainly no vale of tears, but the lowly onion has its place. In this midyear report, Machrone finds a new ingredient in the software salad.

Here we are halfway into 1984. This was going to be the Year of the Mouse, remember? Or was it the Year of the Window?

It isn't either. It's the Year of the Onion. The onion is the perfect paradigm for integrated, multifunction software: It's layered, with only as much visible as you need at a given moment.

What happened to the mouse? Two things: Most of us couldn't find the requisite 100 square inches of available space on our desks, and the mouse was discovered to be a less-than-optimal pointing tool. Indeed, about the only program I can think of that really uses the mouse effectively is Microsoft's *Word*. The rest of the software on my machine doesn't even know the mouse is there.

I've had good experience with the Logitech mouse; I'm particularly fond of its ability to simulate the cursor commands from the keyboard. But I invariably end up using the back of a notepad for a rolling area, piling it on top of all the papers and junk on my desk.

Well, if not the mouse, what about that technological trendsetter, the window?

Visi On and *Windows* would have been forces to reckon with if they had come out in 1983. Both offer the advantage of a consistent interface, a fancy way of saying that all programs work the same or look the same from the computer's viewpoint. But both products only handle application programs written to their requirements. And they interpose a layer between you and the operating system—good for usability, bad for performance.



Bill Machrone

Some of the new packages that allow you to integrate your current software, such as *Desq*, may have a chance. The combination of convenience, familiarity, and simulation of multitasking is attractive. But hold the mice, hold the windows; I'll just take onions.

Onions Forever

A perfect example of onion software is Ashton-Tate's *Framework*. The outer skin is the outline manager, which organizes your work and controls access to the inner layers. The text editor and spreadsheet program coexist at the next level, with the graphics package just below.

Beneath it all, however, is a programming language. The casual or nontechnical user need never know it's there. The programmer can exult over it, calling upon virtually all of *Framework*'s capabilities.

This is the essence of onionness: Individual users see (and need to see) only as much as they are ready for. They can call on extreme handholding at the outset, with help menus and a simplified command set, but still receive sufficient functionality to make their efforts rewarding.

Onionness is not new: *WordStar* has had elements of it for years. When I used to train new personal computer customers, the calibrating question I asked was, "Which 40 percent of *WordStar*'s features do you need to learn?" I'd start them out at Help Level 3. Soon they were asking the questions that paved the way to the more advanced features.

Another early onion is good old *dBASE II*. For each programmer who uses every documented feature (and a few that aren't) in its programming language, there are dozens of others who make do with CREATE, EDIT, LIST, and REPORT. Oh, they might learn to do a few SETs along the way, but nothing fancy.

(continued)

Pick up a SixPakPlus™

Introducing...SixPakPlus™, the refreshing new 384KB multifunction card! In response to the changing needs of the IBM PC and PC-XT marketplace, AST Research, Inc. is proud to announce the latest addition to our line of multi-function enhancement products, the **SixPakPlus**! This new product is the result of extensive marketing research into the needs of IBM PC users whether they have the original 64K system board, the newer 256K system board, or the PC-XT. The **SixPakPlus** has been engineered to meet these needs at a competitive price while maintaining AST's high standards for quality and reliability.

The **SixPak**, as we like to call it, could have been named for the six banks of RAM on it. However, we like to think that it was named for the six functions of the card.



for your IBM® PC.

The features of the **SixPak** include:



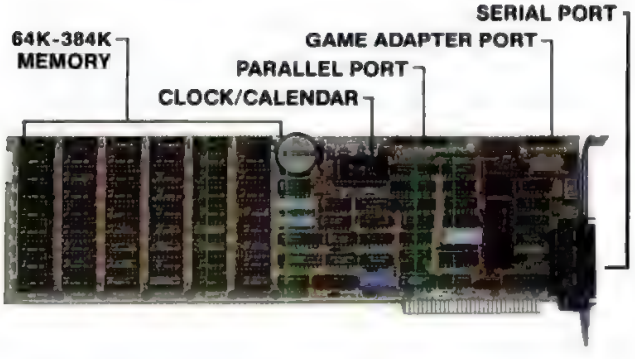
1. RAM memory starting at 64K, user-expandable in 64K increments to 384K. This makes the **SixPak** ideal for the PC or PC-XT with a 256K system board; 384K on a **SixPak** added to 256K on the system board yields 640K, the maximum addressable user memory in these systems.

2. One Serial (async) communications port, configurable as either COM1 or COM2, for use with serial printers, modems, a "mouse," and other serial devices. The serial port has on-board jumpers for easy management of the RS-232C lines, simplifying the wiring of cables in many installations.





3. One Parallel (printer) port, configurable as LPT1 or LPT2 (LPT2 or LPT3 when the IBM monochrome card is installed), for use with the IBM/Epson and other compatible printers. The port is compatible with IBM diagnostics.





4. A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.



5. An optional IBM-compatible Game Adapter port, for use with an IBM-type joystick. In conjunction with application programming, this game port may be used for cursor control, in generating graphics or for playing games at the end of your work day!



6. Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.

Most important of all, the **SixPak** comes with the AST "Plus," AST's unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence that gives our products the best price/performance ratio in the industry! Hence the name, **SixPakPlus**!

AST products are available from Computerland, Entre', ComputerMart, and selected dealers worldwide. Call factory if your dealer does not have the AST products you want.

® IBM is the registered trademark of International Business Machines

AST RESEARCH INC.

2121 Alton Avenue
Irvine, California 92714
(714) 863-1333 • TLX 753699 ASTR UR
Dealer Inquiries Welcome

CIRCLE 101 ON READER SERVICE CARD

Onions, of course, come in different flavors. Recently I taste-tested the new *Corporate MBA* and *Smart Set* integrated packages. In *MBA*, the transitions from one function to the next are so smooth as to be virtually undetectable. *Smart Set*, on the other hand, makes it perfectly clear that you've left the spreadsheet and are about to do some database management. But the functions all work the same way. In keeping with their onionness, both programs contain procedural languages that let you (or third-party developers) create tailored applications.

Another notable onion is MDBS's *Knowledge Manager*, colloquially known as *K-Man*. First conceived as a competitor to *dBASE II*, it has picked up a number of additional functions, not the least of which is a spreadsheet that's well integrated into the whole. Currently available modules, such as the graphics and screen-painting subsystems add a few more layers, and the onion will be complete with the addition of a rumored text editor and beginner-oriented front end.

Some users will never avail themselves of half the power of a package like *K-Man;* others will revel in its complexities. But each time they peel away another layer, they'll quietly thank the farsighted designers.

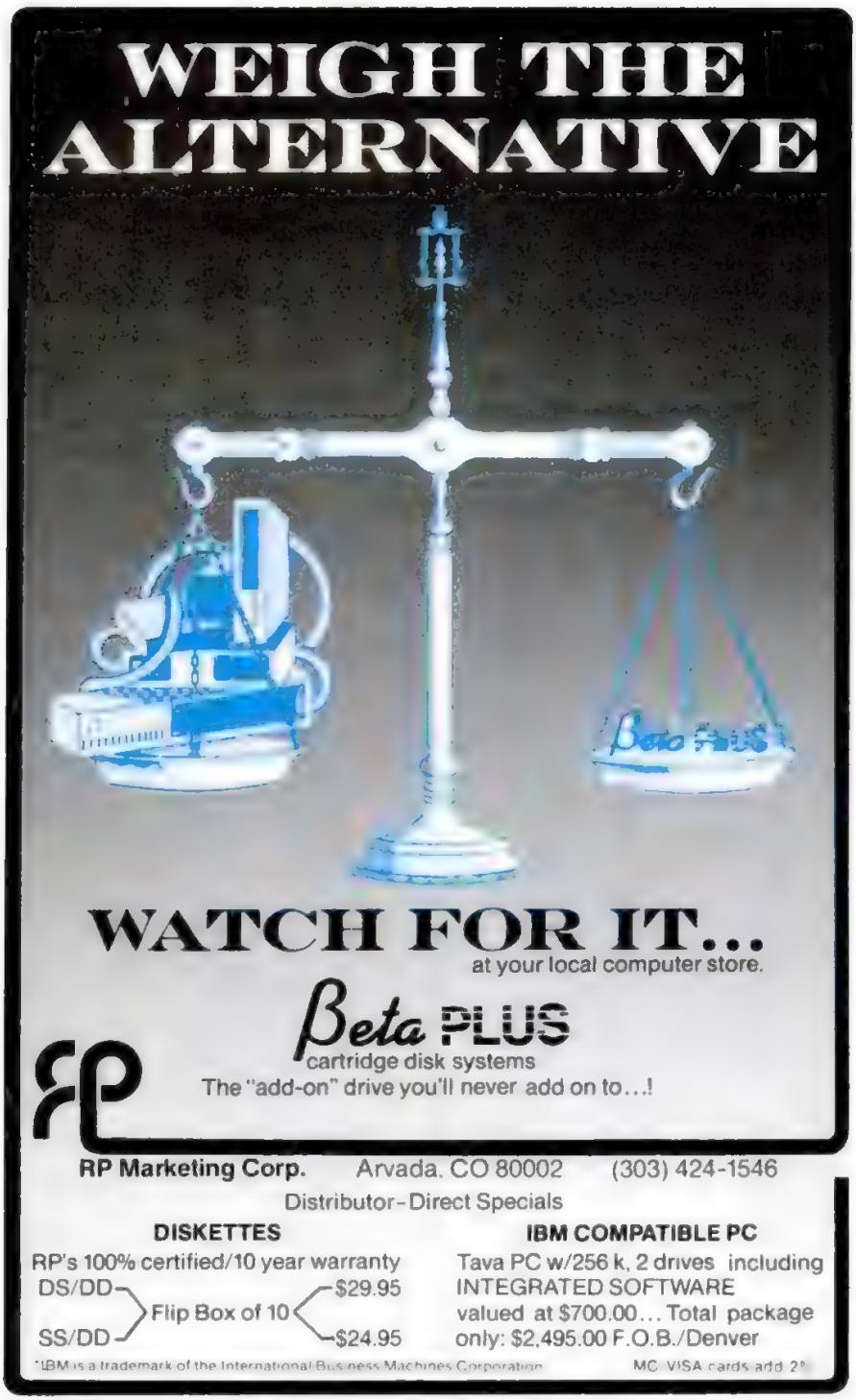
Is there such a thing as a perfect onion? Will software design evolve to the point that one package will do it all? Will every layer eventually be designed into the operating system?

Well, maybe. But that's not the way things have tended to work in this industry or any other. One example is the high end in programmable calculators. Texas Instruments' machines use algebraic entry, while Hewlett-Packard's use a reverse Polish entry system. Is there room in the market for both? You bet!

Hewlett-Packard's new 110 portable has *1-2-3* in ROM—a fine choice and a new high point in integration of hardware and software. But dyed-in-the-wool *Supercalc*[2] users wouldn't touch it with a 10-foot pole. And if *Framework* or *Symphony* is your choice, that's a lot of wasted ROM in your new machine.

Designers will continue to strive for the perfect onion. Buoyed by their success in 1984, more corporations will put serious money and talent into the effort.

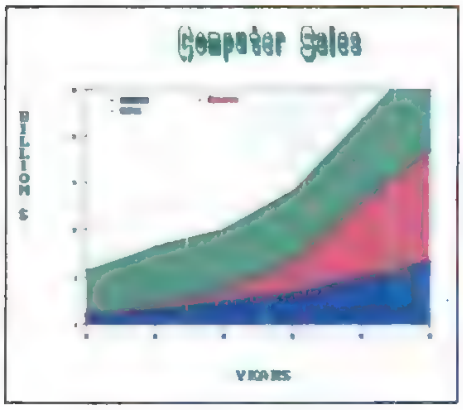
When they're done, you'll want to have it your way: with onions. ■



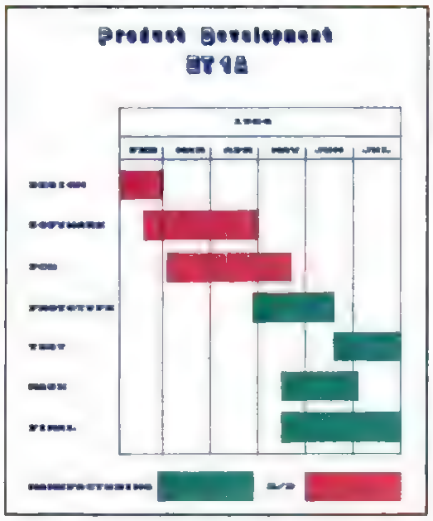
CIRCLE 396 ON READER SERVICE CARD

WHEN SPREADSHEETS DON'T GIVE YOU THE PICTURE...

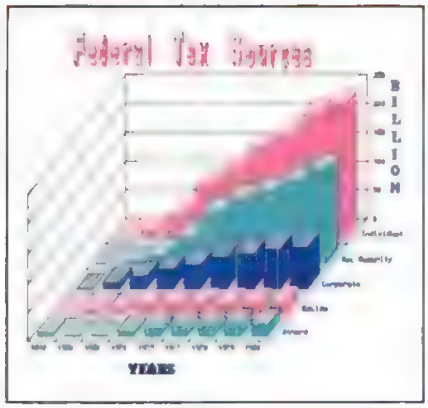
LINE CHARTS
STATISTICS



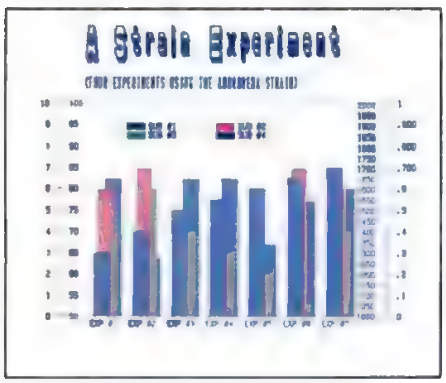
GANTT CHARTS
PROJECT SCHEDULING



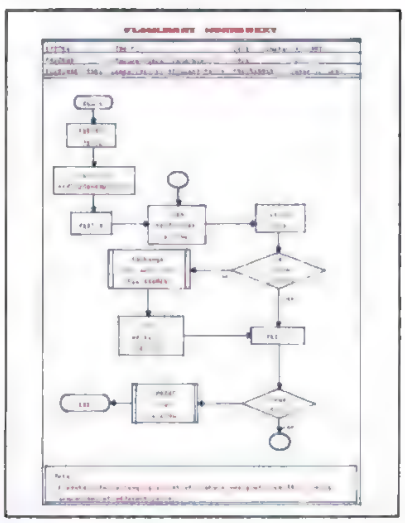
3-DIMENSIONAL
BAR CHARTS



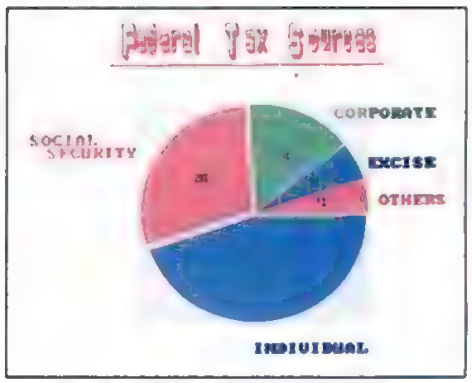
MULTI-SCALE BAR CHARTS
NEGATIVE BAR CHARTS



FLOW CHARTS
ORGANIZATION CHARTS



PIE CHARTS



* HARDWARE CONFIGURATION: IBM-PC; 128K; Dual Disk Drive, Graphics Adapter; Dot Matrix Printer; and/or XY Plotter; Compaq, Columbia and Eagle Computers.

*THE FIRST COMPLETE GRAPHICS PROGRAM DESIGNED FOR EVERY BUSINESS USE ON IBM-PCs**

ENERGRAPHICS™

Dynamic and so easy-to-use, ENERGRAPHICS is already helping business managers at 40 Fortune 500 companies. ENERGRAPHICS is used in Finance, Marketing, Sales, Advertising, Research and Data Processing. Both VisiCalc® and Lotus 123™ spreadsheet files interface with ENERGRAPHICS. For the first time business executives can plan, project, present, analyze and report with the best looking professional graphics available on the IBM-PC and compatibles.

VisiCalc is a registered trademark of Visicorp.
Lotus 123 is a trademark of Lotus Development Corp.

Call 800-325-0174
(except in Missouri)
for our detailed
***ENER**GRAPHICS brochure*

ENERTRONICS

Enertronics Research, Inc.
150 N. Meramec • Suite 207 • St. Louis, MO 63105 • (314) 725-5566

CIRCLE 134 ON READER SERVICE CARD

dBASE II® makes it possible. dPROGRAMMER® makes it easy.



dPROGRAMMER is an accounting package and application generator that takes the "programming" out of using dBASE II.

The advent of dBASE II was a quantum step in computer information management. But to fully appreciate its power can take months of study. Now dPROGRAMMER takes the "programming" out of creating your own application and turns your computer into the management tool you hoped it would be when you bought it.

dPROGRAM your accounting.
dPROGRAMMER comes with a complete accounting package written in dBASE II. Now you can quickly and easily manage your General Ledger, Accounts Receivable and Accounts Payable. Included are the standard reports of balance sheet and income statement, a detailed general ledger, customer and vendor ledgers, and 5 journal registers, as well as many other helpful internal reports. dPROGRAMMER lets you handle sophisticated double entry accounting with simplicity and flexibility unmatched in the industry.

dPROGRAM your business application.
dPROGRAMMER adapts dBASE II to *your* way of doing business. It's quick and easy to use because you organize the access to information by setting up your own menus, programs and files. It's all in plain English with enough depth for both novice and expert. Anyone in your office will be able to organize information so it can be ordered, changed, retrieved and printed to suit every circumstance. dPROGRAMMER does many complex dBASE II functions automatically for you. From mailing lists through complex reports, dPROGRAMMER will manage your data so you're free to manage your business.



Source code provided.
Whether you have extensive dBASE II programming experience or are just learning this exciting language, you'll appreciate having the dPROGRAMMER source code. Not only does this make customization a very real possibility, but also provides examples of extremely well-written dBASE II programs.

dPROGRAMMER is the dBASE II bargain of the year.
dPROGRAMMER is the only dBASE II add-on product you will ever have to buy. It's a comprehensive business tool for dBASE II users that comes with everything you need to get the most out of your computer. Right away. What's all that worth? dPROGRAMMER costs just $295, much less than you'd expect to pay for the accounting source code alone! dPROGRAMMER is the sensible solution for all your information management needs.

dPROGRAMMER runs on any computer that will support dBASE II (8 or 16 bit). For more information, contact Sensible Designs at 10791 Tierrasanta Blvd., San Diego, CA 92124.

CIRCLE 823 ON READER SERVICE CARD

Better yet, call (619) 268-0123 today.

SENSIBLE DESIGNS©

© Sensible Designs 1983
dPROGRAMMER is a registered trademark of Sensible Designs.
dBASE II is a registered trademark of Ashton-Tate.
dPROGRAMMER is not a product of Ashton-Tate.

COMPUTER DISCOUNT PRODUCTS

HUGE Inventories • IBM Specialists

★ ASK ABOUT OUR FAIR PRICE POLICY – *IT'S GUARANTEED!* ★

Epson FX-100



$699.

CDP IS YOUR AUTHORIZED MicroPro. DEALER



INFOSTAR	269.99	SUPERSOFT	149.99
PRO OPTIONS	199.99	WORDSTAR	259.99
STARBURST/INDEX	139.99	WORDSTAR PRO	399.99

INFOCOM

DEADLINE/ENCHANTER	ea32.99
INFIDEL/WITNESS	ea32.99
PLANETFALL	32.99
SORCERER *New!*	37.99
ZORK I, II, III	ea24.99

Continental

FCM: 1st CLASS MAIL	71.99
HOME ACCOUNTANT	64.99
PROPERTY MANAGEMENT	329.99
TAX ADVANTAGE	44.99
ULTRAFILE	144.99

DISKETTES

	10	100
DYSAN 5" SS/DD	31.99	299.99
DYSAN 5" DS/DD	38.99	369.99
MAXELL 5" SS/DD	27.99	259.99
MAXELL 5" DS/DD	37.99	359.99
VERBATIM 5" SS/DD	24.99	235.99
VERBATIM 5" DS/DD	36.99	349.99

APPLE

$CALL

Complete Product Lines Available For Apple!

BEAGLE Apple Mechanic	19.99
DOLLARS & $ENSE	69.99
FLIGHT SIMULATOR II	37.99
KENSINGTON System Saver	64.99
KOALA TouchTablet	85.99
KRAFT Joystick	44.99
MOCKINGBOARD	119.99
ORANGE MICRO Grappler +	114.99
PFS Write (IIe)	99.99
PADDLE ADAPPLE	34.99
THUNDERCLOCK	99.99
ULTIMA III	39.99
VIDEX Ultraterm	349.99

IBM SOFTWARE

ALPHA Typefaces	79.99
ASHTON TATE dBASE II	399.99
Friday	179.99
Encyclopedia	59.99
BRODERBUND Loderunner	24.99
Serpentine	24.99
CENTRAL POINT Copy II PC	25.99
CROSSTALK	139.99
LIFETREE Volkswriter	119.99
MASTERTYPE	26.99
MICROLAB Miner 20-49er	27.99
MICROSOFT Flight Simulator	34.99
Multiplan	169.99
Word	259.99
Word w/Mouse	315.99
NIGHT MISSION PINBALL	32.99
NORTON UTILITIES	55.99
PC Crayon	49.99
PFS File	99.99
Graph	99.99
Report	89.99
Write	99.99
SIERRA ON-LINE Crossfire	21.99



MONOGRAM

$109.99

IBM HARDWARE

KOALA TOUCH TABLET

$95.99



½ Height DS/DD Drive	239.99
AST I/O Plus	119.99
Mega Plus II	265.99
Six Pack Plus	269.99
HAYES 300 Baud Smartmodem	209.99
1200 Baud Smartmodem	499.99
1200B Modem	429.99
KRAFT Joystick	44.99
Paddle	34.99
MICROSOFT Mouse	129.99
NOVATION 103 Smart Cat	169.99
103/212 Auto Cat	399.99
Access 1-2-3	469.99
PLANTRONICS Color Plus	375.99
TG Joystick	44.99
TITAN 64K Board	499.99

MONITORS

JSI for IBM *NEW!*	$CALL
AMDEK 310A (Amber)	$CALL
MAX 12 (Amber) *NEW!*	119.99
PRINCETON RGB HX-12	485.99
TAXAN 420 RGB	499.99

QUADRAM

MICROFAZER Par/Par 8K	129.99
MICROFAZER Ser/Ser 8K	139.99
QUADBOARD I or II	269.99
QUADCOLOR I	205.99
QUADCOLOR UPGRADE	209.99
QUAD 512 + (64K)	**219.99**

ACCESSORIES

FINGERPRINT (Epson Enhancer)	44.99
FLIP 'n FILE (25)	17.99
FLIP 'n FILE (50)	27.99
FLIP 'n FILE (Original 5¼")	17.99
KENSINGTON PC Saver	29.99
LIBRARY CASE	1.99
NOVATION Access 1-2-3	469.99
PRINTERS C-ITOH	379.99
Epson FX80	549.99
Epson RX80	349.99
Okidata 82-93	$CALL
PRINTER STAND Sm. (Plxgls)	24.99
Lg. (Plxgls)	29.99
RIBBONS-FX, MX, RX80	4.99
FX, MX, RX100	7.99
Many Others Available	$CALL

EDUCATIONAL SOFTWARE!

SPINNAKER Facemaker	23.99	Alphabet Zoo	21.99
Fraction Fever	23.99	Delta Drawing	29.99
Kindercomp	21.99	Hey Diddle Diddle	21.99
Snooper Troops I & II	29.99	Story Machine	23.99

– SINCE 1977 –
RETAIL SHOWROOMS IN CALIFORNIA:
San Jose • (408) 241-2300
San Mateo • (415) 571-1658
San Francisco • (415) 626-2244

COMPUTER DISCOUNT PRODUCTS
860 S. Winchester Blvd., San Jose, California 95128
MAIL, PHONE, WILL-CALL SERVICE FROM 6AM (PST)
– CALL (408) 985-0400 –

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- International Orders Welcome
- Min UPS Chg $4 + Ins
- Min US Postal Chg $10
- P.O.'s Welcome – Call First

VISA AMERICAN EXPRESS MasterCard

CIRCLE 230 ON READER SERVICE CARD

LOOK WHO BUYS SOFTWARE FROM US!

IBM • XEROX • NCR
CHEVRON • GTE • SPERRY
JFK SPACE CENTER • ARAMCO
AT&T • BENDIX • PRICE WATERHOUSE
HEWLETT PACKARD • GENERAL ELECTRIC
GENERAL DYNAMICS • TRW • KAISER CEMENT

If you order software from us, you're in good company. You see, some of our best customers are America's biggest corporations.

Maybe they're attracted by our low, low prices (big companies are price-conscious too!).

Or maybe when you're an "IBM", you're looking for something extra. Like the personal service, giant inventory, and in-depth technical support you'll find at 800-SOFTWARE.

You see, when you call us, we'll take care of you like our business depends on it. Because it does. Which means when you place an order, you can be sure we'll fill it promptly. And that our unique Order Tracking System™ is keeping tabs on your order every step of the way.

Most important, we'll be there if you need us after your software arrives. We'll make sure that you'll receive the finest technical support and customer service in the industry. And that's a promise.

Next time you're looking for low price and great service, do what IBM, General Electric, and a lot of other big companies do. Pick up the phone and give us a call.

We'll show you why some hard-headed companies buy their software from us.

CHECK OUT ALL OUR INCREDIBLE BUSINESS SOFTWARE PRICES:

WordStar® PROF PAK $389	Lotus™ 1-2-3 CALL	EasyWriter II System™ CALL	dBase II & III™ CALL
WordStar® $269	InfoStar™ $289	IUS Accounting™ CALL	Crosstalk™ $119

ANDERSON BELL™		dGraph	CALL	LOTUS™ 1-2-3	CALL	RBase Program		Quadlink	$559
Abstat	$339	dUtil	CALL	MAXELL™ DISKETTES	CALL	Interface	$299	ROSESOFT™	
ASHTON-TATE™		All Other Products	CALL	MEMOREX™		MICROSOFT™		Pro Key	$ 99
dBase II & III	CALL	HAYES™		DISKETTES	CALL	Fortran	$269	SOFTWARE PUBLISHERS™	
dBase II User's Guide	$ 20	Smartmodem 300	$249	MICROPRO™		Multiplan™	$149	PFS File	$105
Friday!	$219	Smartmodem 1200	$549	WordStar		Word™	$289	PFS Graph	$105
ATI™ TRAINING		Smartmodem 1200B	$489	(w/Training Mod.)	$269	Word™ w/Mouse	$359	PFS Report	$ 95
PRODUCTS	CALL	HERCULES™		WordStar Prof. Pak		All Other Products	CALL	PFS Write	$105
BUSINESS SOLUTIONS™		Color Graphics Card	$409	(WS/MM/SS/SI)	$389	MICROSTUF™		SOFTWORD SYSTEMS™	
Jack II	CALL	HOWARDSOFT™		WordStar/MailMerge	$369	Crosstalk	$119	Multimate	CALL
CDEX™ TRAINING		Tax Preparer	$229	InfoStar	$289	NORTON™		SORCIM™	
PRODUCTS	CALL	HUMANSOFT™		Options Pak		UTILITIES	$ 59	Supercalc 2	$169
CONDOR™ 3	$269	DB Plus	$ 79	(MM/SS/SI)	$169	PALANTIR™	CALL	Supercalc 3	$259
CONTINENTAL™		IMSI™		MailMerge	$139	PEACHTREE™		All Other Products	CALL
Home Accountant	$105	4-Point Graphics	$129	PlanStar	$339	PEACHTEXT 5000	$239	THOUGHTWARE™	CALL
DIGITAL RESEARCH™		All Other Products	CALL	ReportStar	$229	PERFECT SOFTWARE™		VISICORP®	
CPM 86	CALL	IUS™		Star Index	$129	Perfect Writer	$209	Visicalc Advanced	
Concurrent CPM 86	CALL	EasyWriter II System™	CALL	All Other Products	CALL	Perfect Link	$119	(Apple IIe)	$269
CBasic 86	CALL	EasyWriter I System™	$140	MICRORIM™		All Other Products	CALL	Visicalc	$189
All Other Products	CALL	IUS Accounting™	CALL	RBase 4000	$369	QUADRAM™		Visi-On Products	CALL
FOX & GELLER™		All Other Products	CALL	RBase Extended		Quadboards		All Other Products	CALL
Quickcode	CALL	LIFETREE™		Report Writer	$109	64K/256K	$329/$489		
		Volkswriter Deluxe	$179						

WE ALSO CARRY HUNDREDS OF OTHER PRODUCTS!

WRITE:
800-SOFTWARE, INC.
940 Dwight Way, Suite 14
Berkeley, CA 94710

Copyright 800 Software 1984
Microsoft is a registered trademark

800-SOFTWARE

TO ORDER CALL TOLL FREE:
800-227-4587 or 415-644-3611

- ☐ We guarantee our products against manufacturing defects.
- ☐ Quantity discounts available through our National Accounts Program.
- ☐ Purchase orders accepted. Please call in advance
- ☐ Prompt U.P.S. or Federal Express shipping. Overnight delivery available. Call for shipping charges.
- ☐ Call for free catalog and other low software prices.
- ☐ We do not add surcharge for credit card purchases.
- ☐ Prices may change.
- ☐ International orders welcome: Telex #751743 800-SOFTWARE UD.
- ☐ Compuserve Key Word "GO-EH"

CIRCLE 236 ON READER SERVICE CARD

It's Time for A Change in MIS

Corporate computer needs are changing, and MIS departments need to change with them—but how? Here are tips for MIS departments that want to evolve to meet the demands of 1984.

MIS departments need to change. It's becoming increasingly clear that the technological advances of the past few years have outpaced the MHS department's ability to absorb and respond to them.

As MIS departments first evolved, their structures and jobs were geared to support the highly centralized computing environment that existed at the time. But the industry has changed dramatically. Personal computers have been introduced, and as a result, the era of totally controlled central computing is gone; the power has shifted onto the desk of the end user.

The most common management information system response to personal computers has been to establish a person or small group to insure that micro users are acquiring acceptable hardware and to offer technical support.

Now, industry and technological changes require both philosophical and organizational shifts for MIS departments. Dedicated people in new job responsibilities are needed to support the new demands. Five basic steps can help to build the MIS department of the future:

- **Dedicate resources** for software evaluations and selection, management of retailers, and third-party developers and consultants. MIS departments must recognize that, with rare exceptions, they will be *buying* software and associated services. They will therefore need staff members to carry out ongoing evaluations and selections and manage software vendors, developers, and consultants.
- **Establish a vendor services area.** Success with vendors requires a staff that knows how to evaluate and select a vendor company. People who know how to prepare or negotiate vendor contracts are also necessary in the new MIS department.



Irene S. Nesbit

- **Develop and nurture a new breed of analyst.** Simply analyzing a company's user requirements is no longer sufficient. The analysis must include an evaluation of the technical options available. Analysts must blend leadership, imagination, corporate strategy, economics, and an understanding of the business problems to develop successful computing solutions.
- **Restructure and reorganize** the MIS job categories and salary structures to reflect the changes in the computing industry. These changes mean new jobs with new responsibilities. These roles should receive the status, pay, and career futures that will attract people with the right skills, talent, and experience.
- **Anticipate future user and corporate requirements.** MIS departments must begin to apply greater resources to micro users and to the integration of micros into the overall computing environment. The arena of end-user computing encompasses many activities—training, coordination, facilitation—all of which should be integral to the services MIS provides.

Most important, MIS departments must predict the future. A true distributed network combining PCs, supermicros, file servers, minis, and mainframes may be the corporate requirement of the future. Successful MIS departments must begin to understand and work on future corporate needs now.

MIS departments were once the agents of change for corporations. Today they need to implement changes in their own organizations. ■

Irene Nesbit is the president of Nesbit Systems, Inc. She analyzes and develops software for large companies.

KNOWLEDGE SYSTEMS INC.

Information Processing Components, Selected for Performance and Value.

FREE SHIPPING — NO EXTRA CHARGE FOR MASTER CARD AND VISA

PREPAID PRICES INCLUDE SHIPPING AND INSURANCE, UPS Ground Continental USA only.

MONITORS

Amdek

300A	143
300G	133
310A	175

Dynax

12" Green	127
12" Amber	138

Taxan

RGB III	446
RGB 420	534

PGS

PGS HX12	473
MAX 12	196
SR 12	Call

USI

Pi 2 12" Green	125
Pi 3 12" Amber	142

Sanyo

8112 Hi/Res	195

NEC

JB 1201	162
JB 1205A	172
JC 1410	817

MODEMS

Hayes

300	207
1200	493
1200B	432
Micromodem IIe W/T	242

US Robotics

Password	307
Autodial 212A	460

Novation

Access 1,2,3	454
Apple Cat II	277

Prometheus Products

Promodem 1200	365
Options Processor	78
Memory .. $30 per 16K up to 64K	
Alphanumeric Display	78
Procom Software-Apple, IBM	78

Rixon

PC212A	415
P212A	415

IBM ACCESSORIES

Ast Research

6-Pack	225
Combo Plus	225
Mega Plus	225
64 K Ram Set	55

Plantronics

Color Plus	375

Hercules Computer

Hercules Graphics Card	350

Amdek

MAI	477

Koala

Koala Graphic Tablet	Call

Everex

Dual Display	Call

Number 9

Number 9 1448X1448	Call

PRINTERS

C. Itoh

Prowriter 8510P ... 120 cps	340
Prowriter 8510SP ... 180 cps	477
Prowriter 8510SPC 180 cps color	552
Prowriter 1550P ... 120 cps	552
Prowriter 1550SP ... 180 cps	685
Prowriter 1550SPC 180 cps color	777
New CX4800 plotter	518
New A10 18 cps Daisy Wheel	510
Starwriter F10 40 cps Daisy Wheel	915
Printmaster F10 55 cps Daisy Wheel	1265

We Know How to Make Your Prowriter IBM Compatible

Okidata

92p	160 cps	427
93p	160 cps	705
IBM	Printer Rom	45
2350	350 cps	2000
2410		2380

Star Micronics

Gemini 10X	120 cps	285
Gemini 15X	120 cps	423
Delta 10	160 cps	448
Delta 15	160 cps	633

NEC

3550	40 cps	1698
7710	55 cps	1899

Brother

HRI	16 cps	569
HR25	23 cps	765
HR35	34 cps	Call

Dynax

DX15	14 cps	477
Keyboard		149

IDS

Prism 132 color	1535
Prism 80 color	1419

Transtar

315 color	450

Silver Reed

550	595
500	431

Juki

6100	18 cps	450

Teletex

1014	12 cps	455

Mansman Tally

Spirit	80 cps	315
160	160 cps	641

DISK DRIVES

For IBM

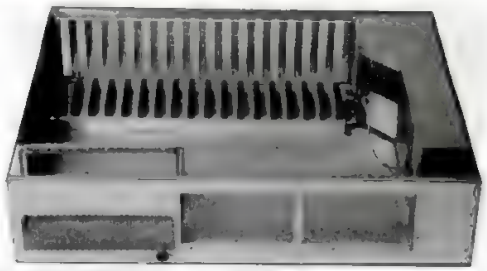
Tandon TM100-2	180
Teac 55B ½ Height	175
Panasonic/Shugart ½ Height	194
CDC	220

For Apple

Super 5 ¼ Height	203
Quentin Ap 100-Y	242
Quentin Ap 105-Y ½ Height	213
Quentin Controller	48
Rana 1	255
Rana 1 with Controller	325
Hard Disks	Call

HAVE IT YOUR WAY

18 Slot Chassis
125 Watt Power
and
IBM Compatible CPU



IMP SYSTEM — $1,300

The S-100 Concept for IBM Compatible Systems

You want a computer. You like the flexibility and options of the IBM PC. EXCEPT there are some things that you want your way. YOU:

- Don't like the funny keyboard.
- Want ½ height drives so you can add a hard disk later.
- Want a powerful supply that is adequate for disk expansion.
- Want more than three additional slots.
- Want a faster or different CPU.
- Want higher resolution graphics.
- Want Dvorak or other keyboard layout.

	List	Our
TIME SPECTRUM	395	Call
APSTEK	369	Call
CRAMBO	359	Call
BIG BLUE	600	Call
EASIBOARD + 15 functions		350
Maynard Sandstar		230
PC GT 80186 8MHz	1195	Call
Scion		1595
Halo-Intlgnt High Res Graphics		150
PROTIUM		1195
Keytronics Keyboard QWERTY		169
Keytronics Keyboard DVORAK		169
Keytronics Keyboard 5151		255

Lotus 1-2-3 users, you need this keyboard.

COMPUTERS

Franklin OMS 1200	1709
Columbia 1600-1	2600
TAVA PC	1900
Eagle I	1650
Eagle II	2050
Eagle III	2270
Eagle IV	3500
Eagle PC-2	2730
Eagle 1620	3400
Eagle 1630	5270
Eagle 1640	6400

TERMINALS

Televideo

914	563
925	717
950	914

Wyse

50	569

Teletex

3000	460

SOFTWARE

Ashton Tate

dBase II	389
Friday	184

Software Arts

TK Solver	215
Solver Pac	88

Seasoned Systems

Sure Stroke Dvorak Tutor	48

Sorcim

Super Calc III	189

Micro Pro

Wordstar	258
Mail Merge	131
Spellstar	131
Pro Pack	475

MBSI

Realworld GI	533
Realworld AR	533

ATI

For Most Software Programs	69

Hayes

Smart Com	72

Micro Stuff

Crosstalk	134

Micro Rim

RBase	344

UNIX

ONX System 5	Call
De Smetc	Call

California Residents add 6.5% State Sales Tax

Shipping extra for outside USA, FPO and APO

Please include an address reachable by UPS, no P.O. boxes, and your phone number where you can be reached during the day.

CIRCLE 271 ON READER SERVICE CARD

(213) 344-4455

Knowledge Systems Inc.
19707 Ventura Blvd.
Woodland Hills, CA 91364

ORDERING TERMS

Prepaid: Money Orders, Cashier's Checks, Certified Checks, Bank Wire Transfers, Master Card, Visa, AMEX (add 3% for AMEX) and Personal Checks (allow 15 banking days for all personal checks). Please include Valid Driver's License # and Major Credit Card for Identification.

Letters to PC

Clowning Around with Norton

Ever since 1981 when I purchased my IBM PC, I have seen scores of computer-related advertisements. There are little ones, big ones, ugly ones, appealing ones, and downright aggravating ones. But I must admit I have never come across anything as asinine as Peter Norton's ads.

The ads are the laughing stock of the town. He's the only person egotistical enough to insist that his picture accompany every ad or article he publishes. But there is no need for dismay; we have taken up a collection to buy Norton a new shirt and tie. The poor guy hasn't caught on yet that the "clown tie" look went out way back in the late sixties. I thought those people from southern California knew what was happening. I do, and I'm from Indiana.

However, I do think he's a fine author. He catches some flack now and then, and maybe rightfully so. I'm not sure what's more fun, waiting for a new release of DOS or waiting for Norton to print an article (complete with a picture of him wearing clown tie) about how bad the new version is.

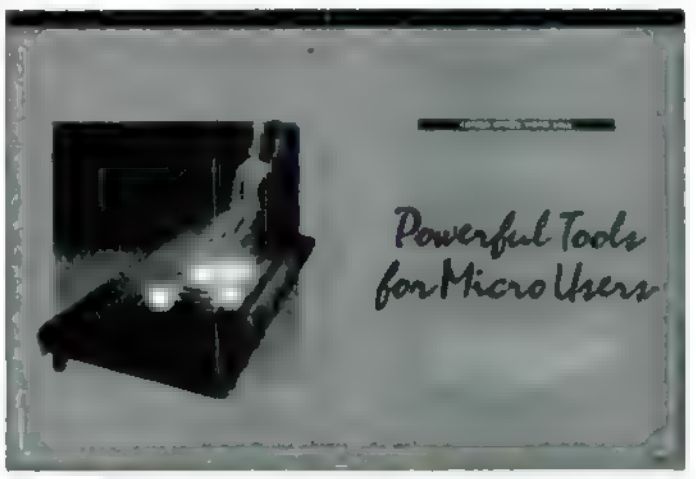
But tell him to keep it up. We really do support him. But that picture . . . .

Greg Baxter
Lafayette, Indiana

Peter Norton replies:
For the ad photo, my wife insisted that I take off the rubber nose and frizzy wig that I normally wear around the office, but I still wore my clown tie. For me, it's a badge of honor.

Macro Facilities

Although we were pleased to see Steve Sall's article, "Macros: Powerful Tools from Micro Users" (*PC*, Volume 3 Number 8), the article did not emphasize that there are two very different types of macro facilities. On the one hand, there are the keystroke-capturing products, such as *ProKey*, that can be used in all application programs. These products are extremely



useful and are simple to use because they add very few commands of their own. Your definitions are basically limited to a sequence of keystrokes in whatever application program you're using.

At the opposite extreme, the most powerful macro facilities are found in *PMATE*-based products such as Landmark Software's *XERGO*, a word processing environment that can use the full *PMATE* macro language. In addition to user variables and arithmetic operations, the macro language provides system variables that indicate what ASCII character, what column, and what line number the cursor is on. It also provides "if-then-else" and looping structures. This type of facility can be used to build specialized commands customized to the user's particular application: automated text manipulation, file conversion utilities, and file analysis routines. This is far beyond what can be done with just a keyboard-capturing product.

Neither type of macro facility eliminates the need for the other. A word processing environment, like *XERGO*, that includes a full macro language facility, can be used very nicely in conjunction with a keystroke-capturing product like *ProKey*. Together you have the best of both worlds and can use whichever macro facility is most appropriate in each instance.

Robert E. Brown
Landmark Software
Sunnyvale, California

Has Osborne Miscalculated?

Adam Osborne's guest editorial, "An Adolescent in Disguise" presents some "facts" that just aren't true (*PC*, Volume 3 Number 9). First, he asserts that "Lotus has been shipping between 7,000 and 12,000 packages of *1-2-3* per month." According to my calculations, if Lotus bypasses distribution and delivers *1-2-3* to the retail chains directly, then they clear $250 on each $495 list price package (we have seen *1-2-3* sold for as little as $299). Since Lotus just sold $28,269,000 in the first quarter of 1984, and since Lotus was still a one-product company at that time, then they sold at least 113,000 *1-2-3* packages, right? If they went through distribution and got less than $250 per copy of *1-2-3*, their sales would be even higher. 113,000 over 3 months is more than 37,000 a month—where in the world did Osborne come up with 7,000–12,000 a month?

The entire point of Osborne's argument, that Lotus is not selling nearly as many software packages as it should, is exactly wrong. Lotus has, in fact, saturated the market!

Hal W. Hardenbergh
Santa Ana, California

Reducing Interference

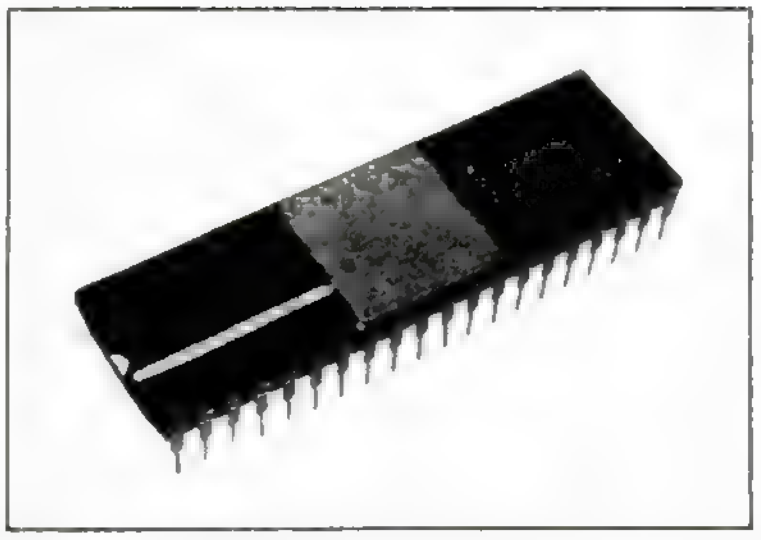
I read Maurice E. White's letter regarding interference with great interest (*PC*, Volume 3 Number 10, page 93). We use a PC in our business, which is electromagnetic interference testing. Our own PC is located near several sensitive pieces of elec-

THE 8087 IS IN STOCK!

Micro Ware is the world's leading retailer of 8087s. We also have the most accurate statistics on chip reliability. They are: .01% infant mortality, .00% adult mortality and .02% 8088 incompatibility. As for ease of installation, we have never had a customer return a chip because of bent pins. We are so confident that you will be able to successfully install and use the chip that we offer a 180-day warranty with every chip we sell. That's 90 days more than anyone else!

To support the 8087 we stock the largest selection of of 8087 software anywhere. This includes: three FORTRANs, three PASCALs, APL, Intel's ASM86, PL/M-86, several Cs, 87BASIC, 87MACRO and MATRIXPAK. For real time or multi-user applications we offer RTOS™ – our implementation of Intel's iRMX executive. Our new products include a professional debugger with 8087 support, an interface library which enables MS Fortran users to call the IBM Basic Compiler Library, and a translator that converts object modules into readable assembly language files. If you have a question about which computer, language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:

Information and Orders—
617-746-7341
University, Corporate and Government Buyers—
617-746-7364



8087 Support from Micro Ware

87FORTRAN/RTOS™ - our adaptation of the Intel Fortran-86 Compiler generates in line 8087 code using all 8087 data types including 80-bit reals and 64-bit intergers. The compiler uses the Intel large memory model, allowing code/data structures of a full megabyte, and supports overlays. Includes RTOS and support for one year **$1350**

87PASCAL/RTOS™ is Intel's ISO-Standard Pascal with 8087-8088 exceptions. These make it possible to use all the 8087 data types directly, while generating modules in one of the three Intel Memory Models. Includes RTOS and support for one year **$1350**

RTOS DEVELOPMENT PACKAGE includes 87FORTRAN, 87PASCAL, PL/M-86, Utilities, TX Screen Editor and RTOS... **$2500**

RTOS—
REAL TIME MULTI-TASKING/ MULTI-USER EXECUTIVE
RTOS is a Micro Ware configured version of iRMX-86. Includes ASM-86, LINK-86, LOC-86, LIB-86, and the ROM Hex Loader **$600**

MWS-286™ Configured to your specifications, our computer runs RTOS-286 or XENIX. Includes one Intel compiler, seven slot multibus chassis, hard disk, streaming tape backup and Intel Service Contract. Six to twenty times faster than your PC ..... **CALL**

Micro Ware not only provides quality products but also the support to make them work. Our users receive newsletters, free software updates, and have access to a hotline for 8087 related advice. Micro Ware is your complete clearing house for 8087 related products. We sell the chips, compilers and applications programs you need at affordable prices. Call for our complete catalogue.

PC TECH JOURNAL REVIEW:
"The Micro Ware package is preferable ... it executes the basic operations more rapidly and Micro Ware provides a free update service."

87BASIC™ includes patches to the IBM Basic Compiler and both runtime libraries for USER TRANSPARENT and COMPLETE 8087 support. Provides super fast performance for all numeric operations including trigonometrics, transcendentals, addition, subtraction, multiplication, and division..... **$150**

87BASIC/INLINE™ generates inline 8087 code! Converts the IBM Basic Compiler output into an assembly language source listing which allows the user to make additional refinements to his program. Real expression evaluations run five times faster than in 87BASIC..... **$200**

87MACRO™ - our complete 8087 software development package. It contains a "Preprocessor," source code for a set of 8087 macros, and an object library of numeric functions including transcendentals, trigonometrics, hyperbolics, encoding, decoding and conversions..... **$150**

87DEBUG™ - a professional debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace features which include the ability to skip tracing through branches to calls and software and hardware interrupts. Breakpoints can be set in code or on guarded addresses in RAM **$150**

FOR→BAS™ - a library of interface routines which allow MS Fortran programs to call the IBM Basic Compiler library and access features such as the RANDOM NUMBER GENERATOR, SOUND, PLAY, DRAW and SCREEN commands..... **$150**

8087-3 CHIP $175
including DIAGNOSTICS and 180-day warranty

64K RAM Upgrade..... **$47.50**

87/88GUIDE - an excellent tutorial on writing 8087 code and interfacing it with compilers. Full of code that runs! **$30**

MATRIXPAK™ manages a **MEGABYTE!** Written in assembly language, our runtime package accurately manipulates large matrices at very fast speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from MS Fortran 3.2, 87MACRO, 87BASIC, and RTOS..... each **$150**

MICROSOFT FORTRAN 3.2 or PASCAL 3.2 - These IEEE compatible compilers support double precision and the 8087..... each **$259**

MICROSOFT C COMPILER includes Lattice C and the MS Librarian..... **$350**

SCO XENIX.™	**$595**
Unisource VENIX/86.™	**800**
FLOAT87 for MS or LATTICE C.....	**125**
SuperSoft Fortran 66	**299**
Computer Innovations C86	**345**
STSC APL★PLUS/PC	**500**
TURBO PASCAL.....	**45**
TURBO PASCAL with 8087 Support.....	**85**
HALO GRAPHICS.....	**CALL**
GRAPHMATIC.....	**125**
ENERGRAPHICS	**295**
Professional BASIC	**295**
Kidger Optical Design Program	**3000**
COSMOS REVELATION	**850**
SuperCalc III with 8087 Support.....	**CALL**
MAYNARD WS1 HARD DISK.....	**995**
MAYNARD WS2 HARD DISK	**1170**
256K RAM CHIPS.....	**CALL**
MAYNARD ELECTRONICS Boards	**CALL**

NO CHARGE FOR CREDIT CARDS
ALL ITEMS IN STOCK

Micro Ware
P.O. Box 79
Kingston, MA
02364
(617) 746-7341

You Can Talk To Us!

IBM PC is a registered trademark of IBM Corp. 8087 iRMX-86, LINK-86, FORTRAN-86, ASM-86, LOC-86 PL/M-86 and LIB-86 are trademarks of Intel Corp. 87FORTRAN/RTOS, 87PASCAL/RTOS, 87BASIC 87MACRO, FASTPAK, MATRIXPAK, 87/88GUIDE, RTOS, 87BASIC+ and Microway are trademarks of Micro Ware, Inc.

tronic equipment. We have managed to reduce the interference from the PC to acceptable levels after investigating several factors: the emissions conducted back onto the AC power line, the radiated emissions, and the susceptibility of the equipment being tested to interference.

I would not expect White or the average PC user to go the extent that we have. However, the Federal Communications Commission (FCC) offers limited protection to the PC user by regulating the first two areas mentioned above. Every PC bears a label attesting to the fact that it conforms to FCC regulations. The problem is that many PC users unknowingly create interference. Aside from the cabinet screws being too tight, the prime offender that we continually find in all sorts of electronic equipment is unshielded cable, external to the equipment. A low-cost, easy fix is aluminum foil. Wrap the foil around the cable, especially any plastic connectors, and ground only one end of the foil (preferably the end that goes to the PC). If this reduces the interference, you will probably obtain even better results through the use of shielded cable or zip-on Zippertubing.

We have some other suggestions and tricks we'd like to share with your readers. They are as follows:

1. Try different length interface cables—one of your cables may be a perfect radiator of a particular harmonic.

2. Move the cables, the PC, or the equipment being interfered with around, and hopefully this will reduce interference.

3. Remove boards from the expansion slots one at a time to find out if one of them is a major source of interference. If you do find an offending board, contact the manufacturer. Ask for help, and if you get the brush-off, inform the manufacturer that the board coupled with the PC must comply with FCC rule Part 15. A final resort is to file a complaint of suspected violation with the FCC. (The complaint can be directed to any FCC field office or to the FCC Office of Science and Technology located in Columbia, Maryland.)

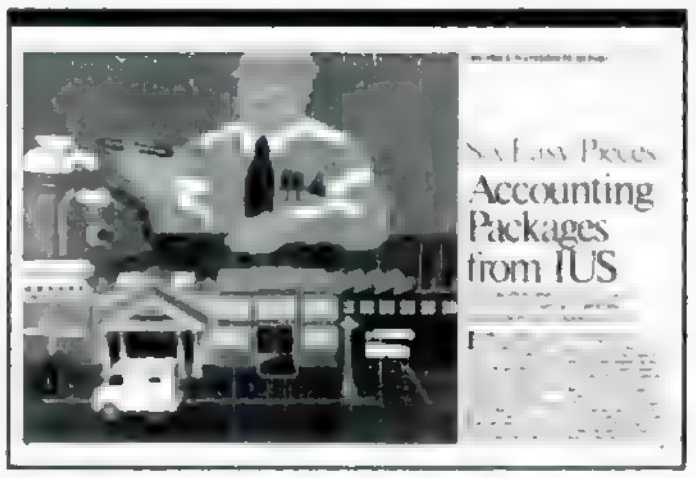
4. Plug the PC into a different AC outlet, preferably one on a different fuse or circuit breaker than the equipment being interfered with.

5. Install a filter to further block emissions conducted back onto the AC power lines. IBM uses one to meet FCC limits, but a second one will further reduce these emissions.

Howard Epstein
Atkinson, New Hampshire

Software Flaw

I read with great interest the Price Waterhouse review of Information Unlimited



Software's (IUS) *EasyBusiness Systems* accounting software packages ("Six Easy Pieces: Accounting Packages from IUS," *PC*, Volume 3 Number 8). We use the entire series in our own operation and have installed it in several of our clients' businesses.

IUS has an excellent series, with one exception. *Payroll* falls flat on its face in the most important area to any employer: government reports. It has none.

You can imagine both our surprise and our clients' surprise when, after months of satisfactory performance, they went to print quarterly reports and found none. A call to IUS confirmed that they were aware of this serious drawback, and we were told that an update was being contemplated for future releases.

Unfortunately, this is no help for those of us who are now forced to use the adding machine to correlate that data for state and federal reports on several hundred employees.

Until this problem is fixed we are recommending that our clients shelve IUS' *Payroll*. For all its excellent bells and whistles, documentation, and support, the lack of consolidated reports makes it worthless. Virtually all the time saved with this otherwise superior package is now wasted because users must transcribe figures from their adding machine tape to the appropriate forms.

Chris M. Kinsey
Anaheim, California

It's Supercomputer!

Congratulations on an excellent Volume 3 Number 9 issue of *PC*. The idea of comparing the PC and a supercomputer was both novel and useful.

There is, however, the danger that numeric ratios could be misinterpreted. A Cray-1 does not equal 1,000 PCs, though the prices and CPU speeds appear to approximate that ratio. The supercomputer is used to do entirely different tasks than those appropriate to a PC.

Nevertheless, I think the articles contrasting the PC and supercomputers were interesting, informative, and entertaining. Keep up the good work.

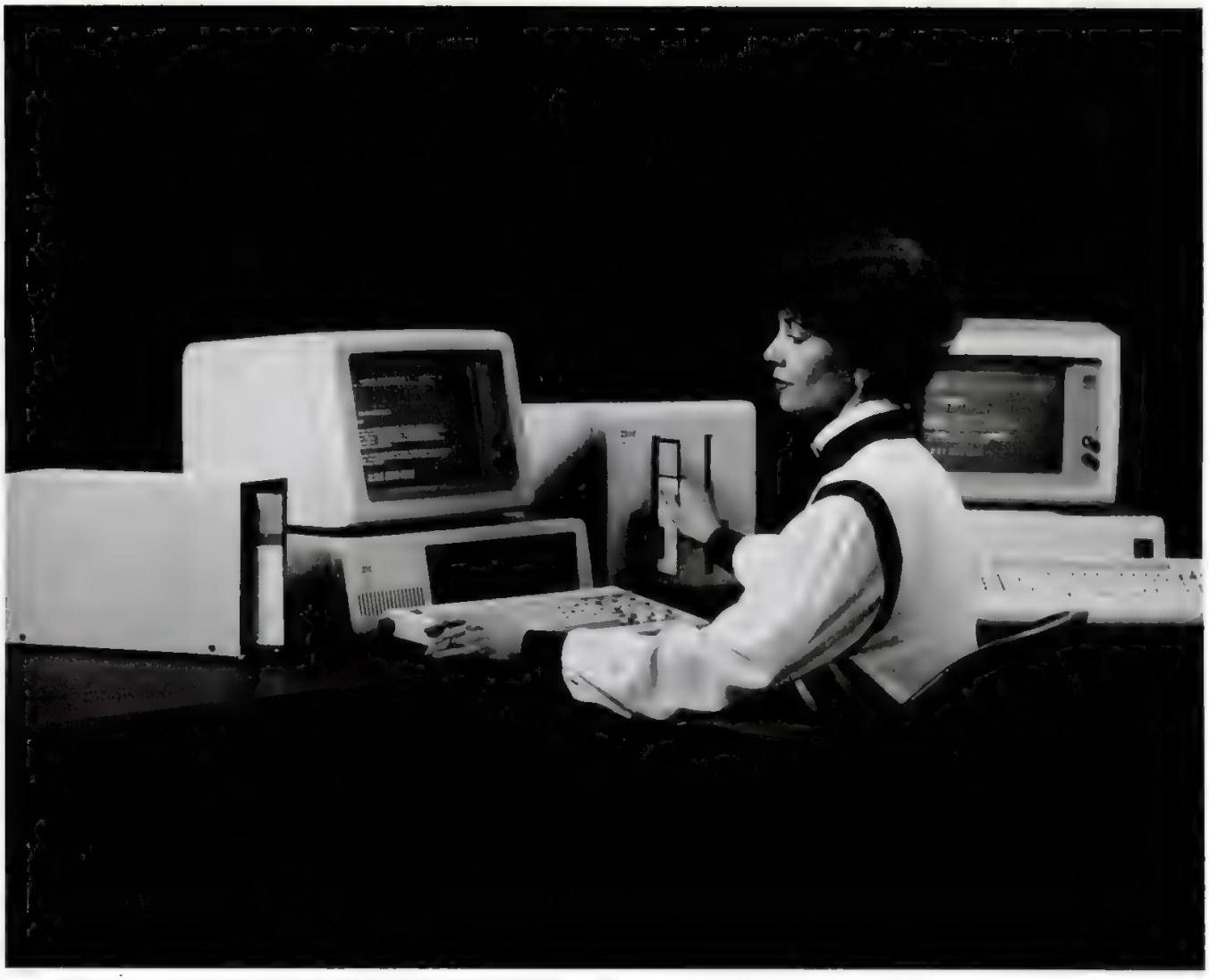
David McManigal
Stormville, New York

You're right, the ratio is not exact. Most companies we know would much rather have access to a thousand IBM PCs than to a single Cray-1 supercomputer!—Ed.

BASIC Comments

"Making BASIC Mind its Millionths" (*PC*, Volume 3 Number 7, page 39) gives readers the wrong advice. While you're right that the CINT function rounds a floating-point number to the nearest integer, CINT also converts the number to an integer in the process. As a result, you get an overflow error whenever you use CINT on a number exceeding positive or negative 32767. This limit makes CINT useless for general financial calculations; FIX and INT do not have this restriction.

Truncation errors crop up in any language that uses binary format for internal



THE FILE CONNECTION

8" DISKETTE SYSTEM FOR THE IBM PC

Our "FILE CONNECTION" programs provide 8" diskette file exchange between the IBM PC and most Micro-Mini-Main Frame computer systems.

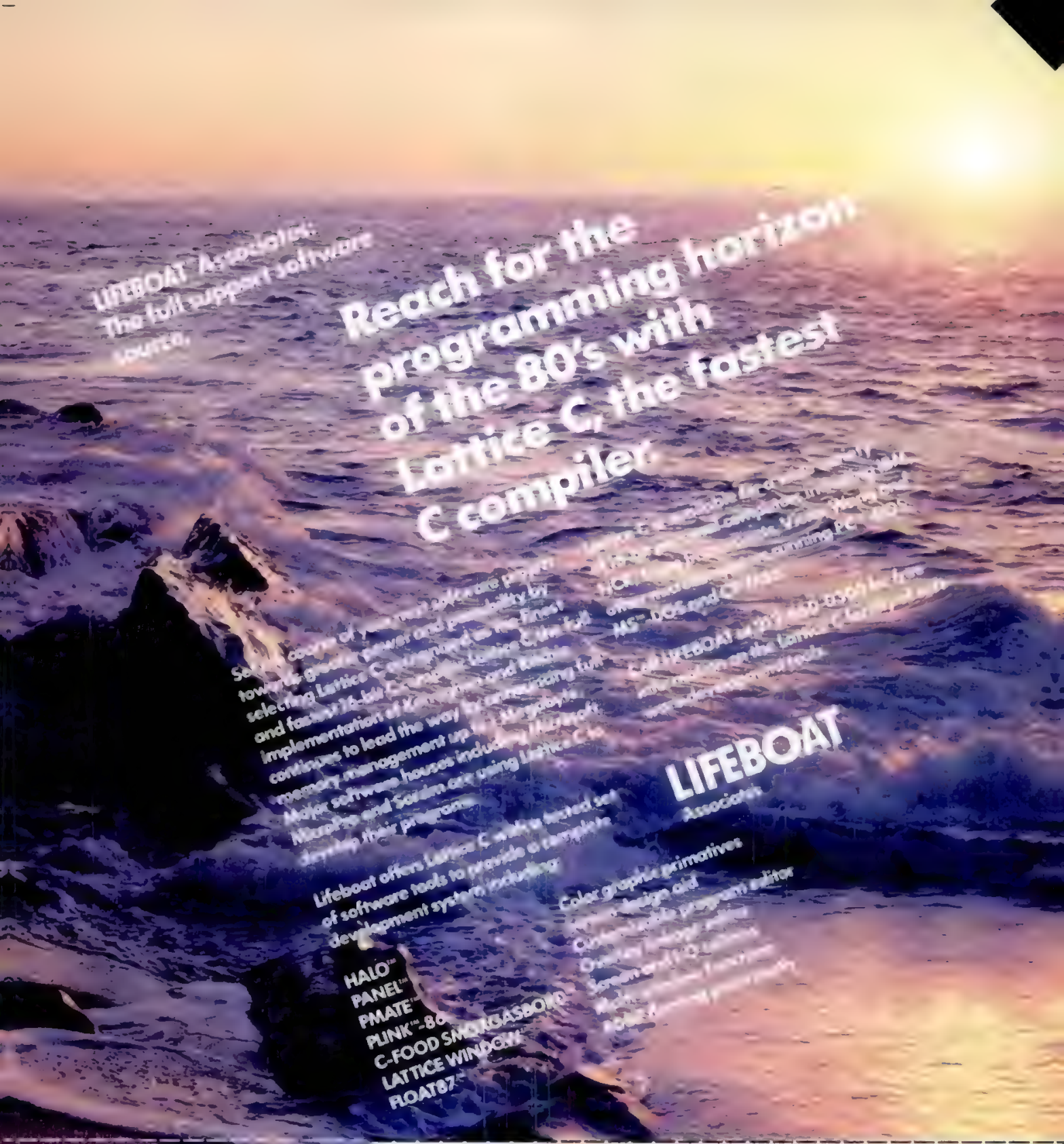
Our "WORD CONNECTION" programs provide 8" diskette text document exchange between the IBM PC and many word processing systems.

Our "DISPLAYWRITER CONNECTION" programs transform documents from Textpack, Wordstar, Multimate, etc. to the new DisplayWrite 2 format.

In addition to our hardware and program products, we also provide a conversion service for customer supplied diskettes. Please contact us for information about the hundreds of 5¼" and 8" diskette formats and systems which we currently support.

FLAGSTAFF ENGINEERING / 2820 West Darleen / Flagstaff, AZ 86001
Telephone 602-774-5188 / Telex 705609 FLAG-ENG-UD

CIRCLE 133 ON READER SERVICE CARD



LIFEBOAT
Associates

1651 Third Avenue
New York, NY 10028
212-860-0300

CIRCLE 136 ON READER SERVICE CARD

Please send me free information on:

- ☐ Lattice and development tools
- ☐ How to get your software published
- ☐ Corporate purchase program
- ☐ Dealer program
- ☐ OEM agreements

☐ **Send me the complete LIFEBOAT software catalog. $3.00 enclosed for postage and handling.**

Name

Company

Address

City

State Zip

Telephone

LATTICE, C-FOOD SMORGASBORD and LATTICE WINDOW, TM @ Lattice, Inc

LIFEBOAT TM Lifeboat Associates
HALO, TM Media Cybernetics
PANEL, TM Roundhill Computer, Ltd
PMATE and PLINK, TM Phoenix Software
FLOAT87 TM Microfloat
IBM and PC ® TM International Business Machines
MS TM Microsoft
CP/M-86 TM Digital Research

WAREHOUSE DATA PRODUCTS

(Formerly Warehouse Software) Call for programs not listed.

Technical Information & Other Information (602) 246-2222
TOLL-FREE ORDER LINE 1-(800) 421-3135

WE ♥ YOU!

For making us one of the fastest growing microcomputer product suppliers in the country. In appreciation, for the next few weeks we are offering a program diskette for the IBM PC with 57 utility programs at no charge to anyone who makes a purchase of at least $125. These programs have been nationally reviewed, and recently updated and are of the highest quality. Included are programs to print labels, balance your checkbook, select printer type fonts, maintain an auto expense log, plus 53 others. We hope that you will like these programs so much that maybe you will ♥ us too.

DATA BASE MANAGEMENT SYSTEMS

Dbase II and Dbase III	Call
Fox and Geller Quickcode	$159
Knowledgeman	$275
Condor III	$330
NWA Statpak	$350
Tim IV	$249
Infostar	$255
PFS File	$95
FRIDAY	$175
Personal Pearl	$145
Fast Facts for IBM PC	$135
RBase 4000	$285

WORD PROCESSING

Wordstar, Mail Merge, Correct Star, Star Index	$345
Wordstar	$235
Mail Merge or Correct Star	$130
Microsoft Word With Mouse	$305
Word Perfect	$295
Volkswriter for the IBM PC	$110
Volkswriter DeLuxe	$175
Aspen Spellchecker	$38
Metasoft Benchmark	$265
Multimate	$275
Peachtext 5000	$195

SPREADSHEETS

Calcstar for IBM PC ... $85 .... Other	$95
Supercalc II	$159
Supercalc III	$215
Microsoft Multiplan	$155
ITK Solver	$289

ACCOUNTING

TCS. equivalent of Peachtree - Specially augmented by Warehouse Software. Customized for your IBM PC Terminal and Printer - GL, AR, PA, AP, CP/M, for PC XT, DOS 1.1, 2.0.
Each Module ... $75 For All Four $275

CYMA	CALL
Dollars & Sence	$5
MBSI GL, PA, AP, AR Each Module	Call

TRANSFER PROGRAMS

Move-it	$85
Microstuff Crosstalk	$105

BEST PRICE IN U.S. FOR IBM PC OR CLONES
Multifunction Board - Includes Async Adapter, Parallel Adapter, Clock with battery back-up and Software, 64K memory expandable to 512K. 1 year warranty $249

LANGUAGES

Lifeboat Lattice C Compiler	$295
Microsoft C Compiler	$325
Microsoft Pascal Compiler	$215
Microsoft Basic Compiler	$285
Microsoft Basic Language	$250
CBASIC 86 for IBM PC	$135

16 Pounds of IBM PC DOS Compatible Portable Computer - Hyperion - 2 Disc Drives -Software.
List $3690 ..... SALE $2695

FOR PC DOS

Norton Utilities	$55
Copy II PC	$24
Prokey V3.0	$89
Harvard Project Manager	$265
Microsoft Flight Simulator	$38

HARDWARE

Hayes 1200 Modem	$495
Hayes 1200b Modem for IBM PC	$425
Anchor Signalman 1200baud Modem	$285
Quadcolor I Board for IBM PC	$195
MPI 320K Disk Drives	$185
CDC 320K Disk Drives	$229
10 MB internal hard drive for IBM PC	$995
10MB external hard drive for IBM PC	$1095
256K Ram Board for IBM PC	$299
Princeton RGB monitor	$479
Corona or Zenith Computer Portable or Desk Top	Call

PRINTERS

Juki letter quality printer	$445
Gemini 15X, 10X Printers	Call
Okidata, NEC, Epson, Printers	Call
Silver Reed, Toshiba Printers	Call

TERMS: Prices include 3% cash discount. Add 3% for charge orders. Shipping on most items $5.00. AZ orders +6% Sales Tax. Prices subject to change.

TOLL-FREE ORDER LINE 1-(800)-421-3135
WAREHOUSE DATA PRODUCTS
2701 West Glendale Ave., Suite 6
Phoenix, AZ 85021

representation of decimal numbers. To correct these errors, you must write special rounding routines. The following function, for example, can be used in a financial application to round a double-precision number to the nearest cent:

```
DEF FNR# (X#)=FIX
(X#*100#+ [SGN (X#)*.5#])/
100#
```

The SGN function (in square brackets) has the effect of rounding positive numbers up and negative numbers down if the least-significant-digit is large enough. This correction makes the rounded result of FNR#(−3.759) be −3.76 instead of the less accurate −3.75.

A bug in ROM BASIC in some early PCs causes INT and FIX to work incorrectly; the functions yield −1 when the double-precision argument is zero. IBM fixed this quietly in later models.

Microsoft's Business BASIC deals with the truncation error problem by storing numbers in binary-coded-decimal (BCD) form. The truncation errors that occur in Business BASIC are the same ones you'd expect in decimal arithmetic, such as ⅓ being truncated to .33333...33.

This BASIC compiler runs on the IBM PC, but its functions are limited to those in an earlier Microsoft BASIC, Version 5.x. Business BASIC has no PC-specific functions, such as graphics, and screen-related operations (including cursor addressing and screen clearing) must be handled by PC-DOS 2.0's ANSI.SYS facility.

Burks A. Smith
Shawnee Mission, Kansas

Airport X-ray Damage

This letter responds to your request for experiences with X-ray machines in airports (*PC*, Volume 3 Number 7, page 79).

I recently flew to Chattanooga and Atlanta to promote our company's product, *Clientfile* (a client management program for insurance agencies). The first demonstration was in Chattanooga. After we passed through the main menu to the

search function, which uses a file indexed on last names, I began to experience problems. The program refused to find any of the names that I knew were stored. Luckily, my prospect had a serious telephone call at that moment, and it gave me the opportunity to use a sector-viewing utility to see what the problem was.

Behold! Random spots were missing, not merely garbled. Upon checking the two backup disks I had brought with me just in case, I found the same to be true, although in different sectors. By divine providence, I was able to reassemble every thing from the three disks and have my program working by the time my potential client returned.

As a precaution, when I traveled to Atlanta, I placed my new disk in the suitcase that I checked (not to my carry-on luggage). That diskette was undamaged.

I could only assume that the damage that occurred the first time was a result of subjection to something similar to a magnetic field when I was carrying the disks with me. I had removed the diskette case from my suitcase, carried it around the detection devices, and opened it calmly for the attendant. I assume that this was the place that the damage occurred, not from direct contact, but from a random strike by a magnetic field that must have been 15 feet from the X-ray machine.

Stephen P. Goodman
Glen Rock, New Jersey

Corrections:

The following product information was omitted from "A Trio of Mailing List Managers," (*PC*, Volume 3 Number 9).

Mailing List I
Alphanetics Software
P.O. Box 339
Forestville, CA 95436
(707) 887-7237, (800) 321-5346
List Price: $49.95
Requires: 64K RAM, 80-column printer.

CIRCLE 747 ON READER SERVICE CARD

(continued)

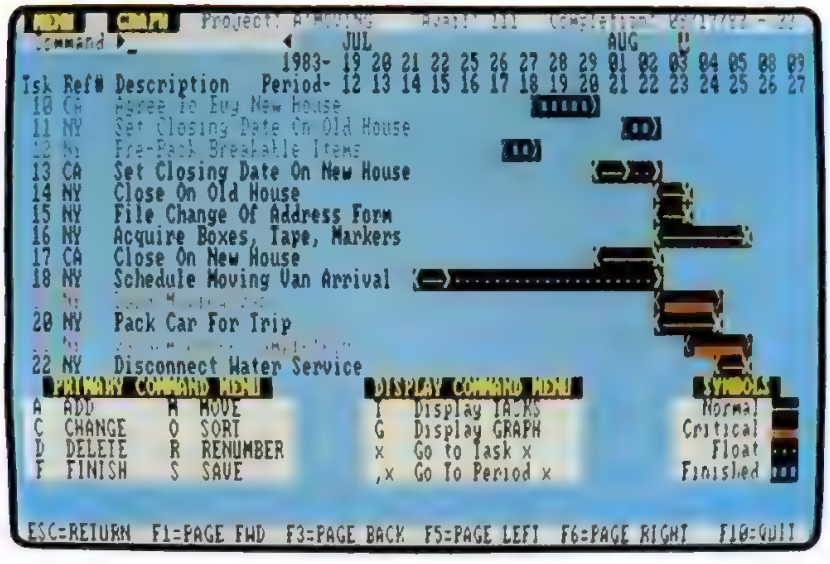


CIRCLE 118 ON READER SERVICE CARD

PLAN YOUR WAY TO *PROFITS* WITH

PRO-JECT 6 PROJECT MANAGEMENT SYSTEM

HARD DISK SHARING AND NETWORK SUPPORT NOW AVAILABLE
ALSO AVAILABLE FOR PCjr.



Planning, simulating, tracking and reporting are key factors in developing and executing a successful project plan. Manual project management techniques can lead to unrealistic committments, missed deadlines and cost overruns due to a lack of up-to-date information, inconsistant or incomplete data, and time-consuming preparation of project reports and charts. Changing priorities can lead to summarized reports which are often misinterpreted. If you are having any or all of these problems, consider PRO-JECT 6 from SoftCorp!

PRO-JECT 6 is a powerful color graphics Project Management System for the IBM PC, PC/XT andPCjr systems which automates these activities. It uses Critical Path Method planning techniques and can display and print horizontal bar chart project diagrams and reports. PRO-JECT 6 can help you meet schedule deadlines and stay under budget by giving you a fast and easy way to plan project tasks, do "WHAT IF...?" simulations and track and report project status. User-friendly menus and prompts guide you from data entry through reports in just minutes. After every change you make to the project, the new critical path is displayed in seconds.

Use the resource feature to define manpower requirements and costs. Use the programmable reporting system to produce departmental breakdowns, "To-Do" lists and management summaries. Use the output profile feature to preview reports on the screen or to pass reports to SIDEWAYS*, 1-2-3* and WORDSTAR*. Use the new hard disk sharing support to keep projects separated when multiple users share an XT. PRO-JECT 6 was designed to be the easiest to use Project Management System available. You could pay more, but you can't buy a more capable Project Management System for the price of PRO-JECT 6.

PRODUCT	MINIMUM MEMORY PC&XT	PCjr	PRICES	
250 Task Capacity	160K	160K	$199	
150 Task Capacity	128K	160K	$149	
75 Task Capacity	128K	128K	$ 99	New!
SIDEWAYS* PRINTING PROGRAM			$ 60	
Optional Hard Disk Sharing (XT only)			$ 35	New!
Demo Disk & Manual			$ 25	

Check, Money Order, VISA, Mastercard & purchase orders are accepted.

TO ORDER CALL:
1-800-255-PLAN
or (813)-799-3984
or send check/money order.
CALL FOR A BROCHURE!

SYSTEM REQUIREMENTS:
IBM PC, XT, PCjr, COMPAQ, EAGLE
CORONA, COLUMBIA, HYPERION
DOS 1.1, 2.0 or 2.1
One double-sided diskette drive
80 column color or monochrome display
Dot Matrix or Daisywheel Printer

SoftCorp INC.
2340 State Road 580
Suite 244
Clearwater, Florida 33575
1-800-255-PLAN
(813)-799-3984

*SIDEWAYS IS A TRADEMARK OF FUNK SOFTWARE
1-2-3 IS A TRADEMARK OF LOTUS DEVELOPMENT CORPORATION
WORDSTAR IS A TRADEMARK OF MICROPRO INTERNATIONAL

Dealer Inquiries Invited

CIRCLE 451 ON READER SERVICE CARD

LETTERS TO PC

PCMAIL
RichWare
12260 SW 124th Ave.
Tigard, OR 97223
(503) 620-6862
List Price: $30
Requires 96K RAM, printer.

CIRCLE 748 ON READER SERVICE CARD

CataList
Automation Consultants, International
18070 Lake Encino Dr.
Encino, CA 91316-4432
(818) 344-9270
List Price: $200 (IBM PC), $250 (XT version)
Requires: 129K RAM, two disk drives (IBM PC) or a PC-XT.

CIRCLE 749 ON READER SERVICE CARD

Mixed up about "Mixing Monitors" in PC Tutor (*PC*, Volume 3 Number 11, page 442)? So were we. The dropped copy will appear in Volume 3 Number 15.

Two numbers were inadvertently switched in the phone number given for IdeaWare ("Creating Order From Chaos," *PC*, Volume 3 Number 9, page 326). The correct number of the company is (212) 334-8043. IdeaWare also has a toll-free number, which is (800) 221-7798.

KEY Software, Inc., the manufacturer of *ResQ* (one of the database management systems reviewed in "Project Database," *PC*, Volume 3 Number 11), has changed its address. It is now located at 1000 Skokie Blvd., Suite 200, Wilmette, IL 60091 (312) 256-6776.

How to Write to PC

Send your questions and comments to Letters to PC, *PC Magazine*, One Park Ave., New York, NY 10016. We are not able to answer letters personally.

All letters become property of *PC Magazine* and may be subject to editing. We cannot print letters that do not include a name and address. ■

26 REASONS TO SUBSCRIBE TO



You'll receive 26 big issues every year of the most current information on the technological breakthroughs that affect you and your PC with *PC*, The Independent Guide To IBM Personal Computers! Every issue of *PC* brings you the latest reviews on IBM and compatible software and hardware . . . newest innovations in programming . . . imaginative applications for business, financial and professional use . . . user-to-user feedback for improved communications . . . 26 times a year! Subscribe to *PC* and pay as little as $1.02 a copy for all the information you'll ever need for your IBM or compatible personal computer!

SUBSCRIBE TO *PC*, The Independent Guide To IBM Personal Computers FOR AS LITTLE AS $1.02 A COPY . . . TODAY!



YES, Please enter my subscription to *PC* for:

☐ One year (26 issues) for $29.97 . . . LESS THAN $1.16 a copy!
☐ Two years (52 issues) for $52.97 . . . LESS THAN $1.02 a copy!

Mr/Mrs/Ms _____
please print name in full PC 4S382
Company _____
Address _____
City _____ State _____ Zip _____

Check one: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add $52 per year for postage in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

Single copy price $2.95



YES, Please enter my subscription to *PC* for:

☐ One year (26 issues) for $29.97 . . . LESS THAN $1.16 a copy!
☐ Two years (52 issues) for $52.97 . . . LESS THAN $1.02 a copy!

Mr/Mrs/Ms _____
please print name in full PC 4S382
Company _____
Address _____
City _____ State _____ Zip _____

Check one: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add $52 per year for postage in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

Single copy price $2.95



26 REASONS TO SUBSCRIBE TO

Published Every Other Tuesday!



NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. BOX 2443
Boulder, Colorado 80321

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 66 BOULDER, COLORADO

POSTAGE WILL BE PAID BY ADDRESSEE

P.O. BOX 2443
Boulder, Colorado 80321



If you could get your investment information where Wall Street gets its investment information, you'd get it from us.

Now CompuServe's Executive Information Service puts the most accurate, comprehensive investment information available at your fingertips.

For the first time ever, individual investors can join the ranks of the most prestigious Wall Street firms who depend on CompuServe to provide them with a broad spectrum of comprehensive financial information for research, portfolio management and merger/acquisition strategies.

Instant retrieval of continuously updated quotes on over 9,000 issues and 10 years of daily historical pricing on over 50,000 securities...

Standard and Poor's descriptive information on more than 3,000 companies...

Value Line Data Base-II extensive fundamental data to analyze the performance of more than 1,700 major corporations...

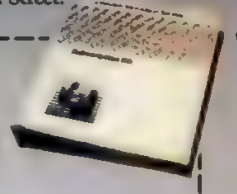
Disclosure II descriptive and financial information derived from SEC filings for over 8,500 companies...

Institutional Brokers' Estimate System (IBES) earnings projections on over 2,800 widely followed companies...

Evans Economics daily updated economic forecasts, historical statistics and analysis of more than 20 major economic indicators plus continuous public opinion polls on economic and financial issues...

Reports on technical market trends, personal portfolio evaluation and the most comprehensive analysis capabilities currently available.

You get all this plus demographic information on every zip code in the U.S., access to consultants through the Geneva Series, state of the art electronic communications, the full scope of the prestigious AP Wire Services, travel information and reservations and more of the high quality financial information that has made CompuServe the premier supplier of investment information to the greatest names on Wall Street.



For a free illustrated guide to CompuServe's Executive Information Service, write or call:

Name _____

Address _____

City _____

State _____ Zip _____

CompuServe

Executive Information Service
P.O. Box 20212
5000 Arlington Centre Blvd
Columbus, Ohio 43220

800-848-8199
In Ohio, call 614-457-0802

An H&R Block Company

CIRCLE 226 ON READER SERVICE CARD

With one line you can draw a thousand conclusions.

Without a good line, it's difficult to draw much of anything. And Taxan has an extraordinary line.

It's a dozen computer display monitors (RGB and composite as well as monochrome), one printer buffer, a television conversion tuner, several coaxial cables and a multitude of PC cards long. All segments designed and manufactured to represent the utmost in computer display technology.

The Taxan product line.

The only one of its kind. Backed by a solid reputation and 15 years in the computer display industry.

So, if you're in the market for a computer monitor or related accessory, just ask one of our dealers to demonstrate our full line.

You can draw your own conclusions.



TAXAN
TAXAN
TAXAN

Taxan Corporation
18005 Cortney Ct. City of Industry, CA 91748
(818) 810-1291

CIRCLE 188 ON READER SERVICE CARD

When DOS Is Not Enough

Not all the programs that run on DOS will run on all the computers that use DOS. There are many reasons for this, and the situation is not likely to change in the near future.

I recently came across a poignant headline: "Why won't all that IBM PC software run on my Z-100?" It was on the cover of *Sextant*, a user's magazine for the Heath/Zenith computers, including the Z-100. The headline introduced an excellent technical explanation of why the Z-100 isn't PC compatible, but the technical information wasn't what moved me. Instead, I was touched by the sad and wistful undercurrent, what you might call PC envy.

Imagine how Z-100 owners must feel. The IBM community has the tastiest and most luxurious software library in the world. The *1-2-3*s and *Word*s are created for the PC first; other machines come second—if at all. Most of that tasty software says, "requires DOS," and Z-100 users look at it and say, "Oh, wonderful; our computers use DOS, so this software should run." Well, this is a case of wishful thinking. These users would like to think that a "DOS program" is DOS generic, but the sad fact is that there are virtually no DOS-generic programs. IBM PC programs are, almost without exception, PC-specific.

Software Services

The DOS and the ROM BIOS service programs that are built into every PC provide a framework of services that programs can use to perform common tasks on the computer. There are a variety of places that a program can turn to for these services. It can ask the operating system, DOS, to perform the task, it can work through the BIOS, or it can work directly with the hardware.



Peter Norton

DOS provides the highest, most portable level of services. With few exceptions, if a program uses DOS services, they will work, unaltered, on any DOS computer.

If DOS provides the highest level of services, the PC's built-in ROM BIOS services fall into the middle. Programs that use the BIOS services are tied to the IBM PC design, but they should be completely model-independent.

The lowest level is to bypass both DOS and the ROM BIOS and work directly with the hardware. This method is used more often than you might expect.

Why don't all programs work exclusively with the DOS services? There are three reasons, one understandable and two quite stupid.

The understandable reason is performance. Each layer of service adds some overhead and usually a loss of speed. For some operations, this disadvantage doesn't matter—either the high-level services are reasonably fast, or the operation isn't performed often enough to matter.

The first stupid reason is simply that the programmers who wrote the DOS services weren't smart enough to see the important advantages of using them. These are the oafs who gave us programs that worked under DOS 1.0, but not under 1.1, and so forth.

The other stupid reason why programs aren't DOS-generic is that DOS was not designed to provide the services that they need, forcing the programs to work on a lower level.

Typical programs need to have a variety of services performed for them. DOS provides a workable set of services for disk operations, and keyboard operations are also well supported, especially considering the special problems of keyboards. When it comes to screen services, though, DOS leaves us in the lurch.

The only screen services that DOS provides are primitive "tty" (or teletype) ser-

"IF YOU'LL PAY FOR WE'LL GIVE YOU

Preview Pak™ An easy, inexpensive way to sample ten exciting new IBM PC* software products.

For a special introductory price of just $39.95, (plus $3.00 shipping & handling) we'll send you a box of 10 *premium quality* BASF ds/dd diskettes . . . just like the ones on the right. Great diskettes at a good price. But what's more, on each diskette we've copied a ready-to-run DEMO of an IBM PC software package—yours at *no extra charge!*

$39.95 COVERS THE DISKETTES; THE DEMO SOFTWARE IS FREE.

We've searched industry-wide for up-and-coming software packages—and here are 10 of the very *best.*

Novice or expert, business executive or programmer—simply insert these demo disks and try out, for *yourself,* an interesting new . . .

- dBASE II Application Generator
- Word Processor
- Spreadsheet Trainer
- Stock Investment Manager
- Communications Package
- Mainframe File Transfer Utility
- Program Development Tool
- Management Skills Aid,
- Negotiations Strategy Tool
- Disk Backup Utility

10 FULL SIZE DEMOS ON 10 DISKETTES

Each Preview-Pak features TEN (10) FULL SIZE / FULL FUNCTION DEMOS . . . complete with easy to follow written instructions. (Recorded double sided. Many require DOS 1.1 or 2.0. Some require extra memory and/or graphics. Many run on compatible machines.)

Examine them at your leisure—under no pressure or obligation. And when you're through, simply peel off the demo identification labels, and *reuse* the diskettes—*you can't lose!*

FEATURING BASF LIFETIME WARRANTY DISKETTES

BASF Qualimetric FlexyDisks feature a unique LIFETIME WARRANTY. (Warranty details available from BASF.)

PREVIEW · PAK PRESENTS:

TRANSEND Communications Software "Transend PC™" Is It the Ultimate? You'll have to See it to Believe It.	HUMAN EDGE "The Negotiations Edge™" Develop a Negotiating Strategy with Expert Assistance.	"BACKUP MANAGER™" by Inter-Tekna™ Efficiently Archives and Re-loads Hard Disk Based Systems.	Autocode 1™ Generates Your dBASE II* Applications . . . in Minutes.	Cross/File™ Sophisticated Mainframe—PC Information Transfer Utility.
SuperWriter™ By SORCIM Advanced Word Processing at Your Fingertips.	C-SYSTEMS "C-Window Debugger™" Symbolic Source Level Debugger—Displays C Source Code as it Executes.	Sundex "Certified Personal Investor™" Your Personal Stock Market Analyst.	ATI Training Programs™ "Spreadsheet Trainer™" Sample ATI's Interactive Training for Popular Spreadsheets.	HUMAN EDGE "The Management Edge™" Improves your Management Skills and Employee Productivity.

(Preview-Pak is a Trademark of Preview Publishing Co.; *IBM PC is a Trademark of IBM; **dBase II is a Trademark of Ashton-Tate.)

Copyright © 1984, Preview Publishing Co.

THE DISKETTES, THE SOFTWARE.*

ALL NEW DEMOS



$200.00 IN DISCOUNT COUPONS!
Inside your Preview-Pak, you'll soon discover a valuable BONUS. Money-saving discount coupons—$20.00 off each featured software product plus a special offer coupon from BASF (Offers limited; U.S.A. only; void where prohibited by law.)

LIMITED AVAILABILITY

We're featuring different demo software every month, so order your PREVIEW-PAK *today* and start a reference library. But inventory is limited. Why delay? For quick delivery

VISA MasterCard American Express Card

CALL TOLL-FREE (24 Hours)
(800) 443-0100 ext. 330A

Or send check or money order for $39.95, plus $3.00 shipping & handling, to . . .

Preview Publishing

P.O. BOX: 590359
SAN FRANCISCO, CA 94159
Ask for Issue 2

California residents add 6.5% sales tax. No CODs please. Orders shipped promptly by UPS—allow 2 weeks for checks to be processed. 3% added for Visa, MasterCard & American Express Card purchases. Damaged or faulty disks will be replaced at no charge. Foreign orders are welcome, please write us for details.

(*Demonstration versions only)

WHY NOT SUBSCRIBE?

If you'd like to check out new software regularly, and receive a steady supply of diskettes, contact us about our unique individual and corporate subscription programs.

Individual Subscription Plan:
Simply tell the operator you'd like to subscribe, and we'll place your name in our computer. Then approximately each month we'll ship you a different Preview-Pak, and your credit card account will be automatically billed at our prevailing advertised rate. Accept delivery or cancel at any time.

Corporate Subscription Plan:
For a GUARANTEED SPECIAL INTRODUCTORY RATE, please mail a company Purchase Order for 6 issues ($257.70) or 12 issues ($515.40). We will bill you.

ORDER TODAY!

EXTRA BONUS! Order your PREVIEW-PAK demo assortment NOW, and we'll also include our attractive LIBRARY STORAGE CASE—a $4.50 value—at no extra charge! Try before you buy. Call *24 Hours* TOLL-FREE (800) 443-0100 ext. 330A—operators are waiting!



People are going for Friday!™ like there's no tomorrow.



Friday! is the new electronic file handling system that has become an instant best-seller because it's so revolutionary.

Within two weeks, it broke into the Top 20 on the sales chart of Softsel, one of the country's leading computer software distributors.

And it's now well on its way to the top.

The Friday! phenomenon is simple.

Friday! uses simple menus and talks to you in plain English, so almost anybody can use it.

It's great for sales and commissions, clients and portfolios, mailing lists and labels, invoices, inventories, paychecks, reports and more. And it works with other microcomputer software like 1-2-3™ and dBASE II® (our own advanced database management system).

It comes with a complete, step-by-step tutorial, but you can set up an "electronic file" without even looking at the manual, then use it at the touch of a few keys.

Friday! finds any filed information in seconds. Computes totals, subtotals, commissions, etc. Prints form letters and mailing labels. Gives you quick reports from all or part of a file with a few keystrokes. Or if you need a special report for your bank or board of directors, just "paint" the format on your screen, then have Friday! do all the work.

And while Friday! does more than file handling systems selling for as much as $495, it's yours for just $295 (suggested retail price)!

For more information, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329 ext. 204. In Colorado, (303) 799-4900. In the U.K., call (0908) 568866.

Or for the name of your nearest dealer, just call 1-800-4-FRIDAY, ext. 204.

ASHTON·TATE

*Ashton-Tate 1983. Friday! is a trademark and dBASE II is a registered trademark of Ashton-Tate. 1-2-3 is a trademark of Lotus Development Corp.

CIRCLE 184 ON READER SERVICE CARD

vices that treat the display screen as if it were a printer or teletype. Few important programs can get by with that alone. In fact, most programs have their most demanding requirements for services exactly where DOS is weakest: in full-screen output operations.

Typical Approaches

I want to discuss what typical PC programs do, and which level of services they usually use.

Programs take a great variety of approaches to controlling and using the PC, but some factors are quite common. For disk operations—finding files, reading and writing data, loading program overlays, and so forth—most popular programs rely entirely on DOS. A few programs, notorious for scrambling disks, don't use DOS, and try to take care of decoding disk formats themselves.

Keyboard operation services vary a bit more. While DOS provides quite adequate keyboard services, many programs go directly to the PC's ROM BIOS for keyboard input—completely unnecessarily, in my view. It's easy to test whether the program you use does this. If it responds to the redirection of input available in DOS 2.x (the <INPUT business, where the program gets its input keystrokes from the file instead of from the keyboard), then it uses DOS to get its keyboard input; if it doesn't respond, you know it bypasses DOS.

DOS provides no full-screen output services, leaving the choice of either the ROM BIOS services or working directly with the hardware. It turns out that the ROM BIOS provides a rich and powerful set of services, so that programs could theoretically rely entirely on them to create their screen output. However, it's somewhat rare for a program to do this. Instead, programs typically use the BIOS to move the cursor around, but create screen displays by working directly with the hardware. There's a simple reason for doing things this way: It's incredibly quick and efficient.

DOS Can Do It

It is possible to generate full-screen output with DOS, thanks to the ANSI device driver, which was introduced with DOS 2.0. The ANSI driver is optional on PC-DOS (it's there, and it will work if you take the trouble to activate it with DOS' CONFIG.SYS start-up option).

The ANSI driver is a complex and fascinating tool, and it provides two key facilities. One is the ability to redefine the meaning of key strokes (a very crude version of *ProKey*); the other is the ability to do full-screen output, with such functions as moving the cursor, clearing the screen, and changing the display color.

Unfortunately, while the ANSI driver can rescue programs that want to do screen output in a DOS-generic way, it's not a final solution. Essentially, the ANSI driver works interpretively, which means that its performance is relatively slow. Its facilities are wonderful, and the DOS world has good reason to be grateful for the existence of a generic screen driver, but it's not adequate for heavy, fast-running use. That's why Microsoft doesn't use it.

I am incredibly impressed with what Microsoft has done to make its own software, such as *Multiplan*, run on a variety of computers. Its full-screen software, such as *Word* and *Multiplan*, comes with an "Install" program that jams the appropriate screen driver into the application program. The list of drivers that can be installed into *Multiplan* is impressive—including both a long list of machine-specific drivers and a number of generic ones that work for standard terminals and display screens.

As far as I know, Microsoft keeps this installable screen driver to itself, giving their products a terrific competitive advantage. If Microsoft would sell it to other software developers, though, a huge amount of software would become available for just about any DOS computer. That would be a great leap forward for both DOS and the entire micro industry. The way things stand now, IBM's hammerlock on personal computer sales is self-perpetuating, because the best software is written for the PC first and only sometimes translated to other machines later.

If someone would create a commercial set of screen drivers with the strength and flexibility of Microsoft's, they could probably get rich licensing it to software vendors, while at the same time loosening the chains binding the industry to IBM. If the non-IBM micro makers had any sense, they would get together and fund an independent effort to create such a set of driver software, and then give it away. But that's a pipe dream.

The Small Fry

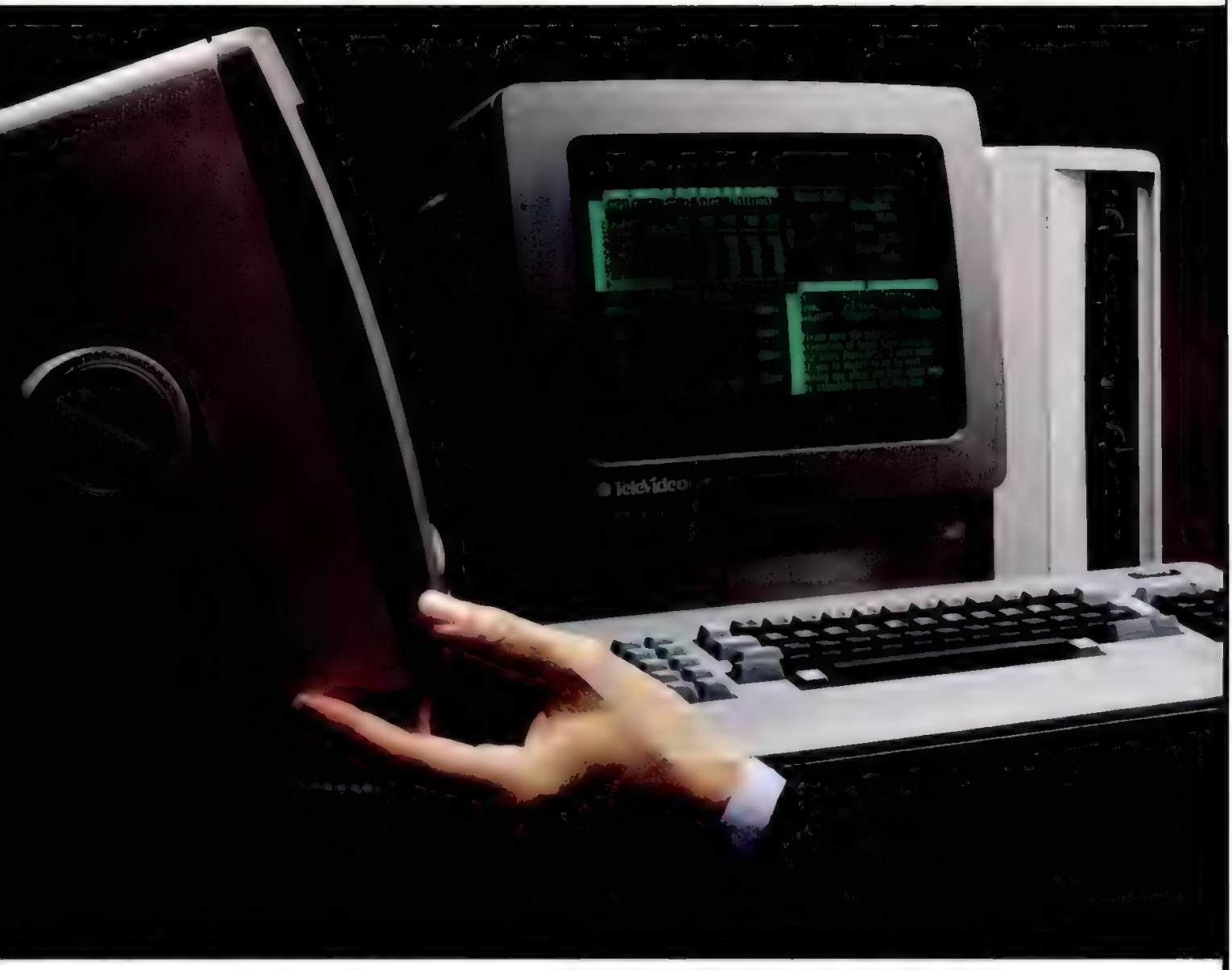
That leaves the small fry of the software world with an interesting problem. While the Lotuses and Microsofts can afford to port their programs to any computer they find worthwhile, the little guys just don't have the resources to do that. That's why we don't see many IBM PC programs, beyond the top tier, being converted to machines like the Zenith Z-100.

My experience is probably typical. I'm currently working on the next major version of my *Norton Utilities*. To the greatest degree possible, I'm trying to make it work on any DOS computer. My approach is, if a manufacturer will lend me a machine, I'll port my software to it. But you'd be amazed at how many personal computer makers won't give me the time of day. I guess they believe that they can sell their machines without any software. (And you wondered why so many computer makers are going out of business.)

Now, my software business is small potatoes compared with Microsoft or Lotus or Ashton-Tate, but I am one of the most prominent and visible of the hoards of small software outfits. If I'm getting the cold shoulder from hardware makers, imagine what's happening to everyone else!

And that, Virginia, is why all that PC software won't run on your Z-100. ■

The TeleVideo IBM PC
The best hardware for



TeleVideo versus IBM. Make a few simple comparisons and you'll find there is no comparison.

RUNS IBM SOFTWARE.

With the TeleVideo® IBM Compatible line—PC, XT and portable computers—you'll get the most out of all the most popular software written for the IBM® PC—more than 3,000 programs.

Because every TeleVideo Personal Computer offers the highest level of IBM compatibility on the market

THE BEST HARDWARE FOR THE BEST PRICE.

Features	Tele-PC	IBM PC	Tele-XT	IBM XT
Monitor	YES	OPTIONAL	YES	OPTIONAL
Screen Size	14"	12"	14"	12"
Tilt Screen	YES	NO	YES	NO
Quiet Operation	YES (NO FAN)	NO	YES	NO
Memory	128K	128K OPTION	256K	256K OPTION
Graphics Display (640 x 200 resolution)	YES	OPTIONAL	YES	OPTIONAL
Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communication Port	YES	OPTIONAL	YES	YES
MS™-DOS/BASIC*	YES	OPTIONAL	YES	OPTIONAL
System Expansion Slot	YES	YES	YES	YES
RGB and Video Port	YES	OPTIONAL	YES	OPTIONAL
Typical System Price	**$2995**	**$3843**	**$4995**	**$5754**

compatibles. the best software.

and has the standard—not optional—features you need to take full advantage of every job your software can do.

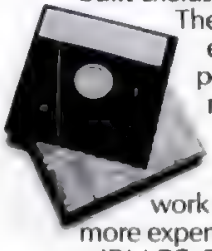
Study the chart at the left. It proves that TeleVideo—not IBM—offers the best hardware for the best price.

Note that TeleVideo's ergonomic superiority over IBM extends from fully sculpted keys and a comfortable palm rest to a 14-inch, no glare screen that tilts at a touch.



THE BEST MICROCHIPS.

What is perhaps most impressive about the TeleVideo IBM PC Compatible can be found deep within its circuitry. We use the same 8088 central processing unit that runs an IBM PC. But we also employ new VLSI (Very Large Scale Integration) microchips that are designed and built exclusively for TeleVideo. These interface more efficiently with the powerful 8088 and yield numerous benefits.



For example, our tiny custom chips do the work of many of the larger, more expensive circuit boards in an IBM PC. So we can offer a computer system that comes in one attractive, integrated case, is ready to run and occupies less desk space. A computer that edges out IBM's added-cost component system for reliability, ease of service and purchase simplicity.

Fewer circuit boards to cool also allowed us to eliminate the noisy, irritating fan IBM and most other PCs force you to put up with. And TeleVideo compatibles accept any IBM hardware options without modification.

THE BEST PORTABLE FOR THE BEST PRICE.

Features	TPC II	COMPAQ
High Capacity Storage	YES	NO
2nd Disk Drive	YES	OPTIONAL
Quiet Operation (No Fan)	YES	NO
Ergonomic Display	YES	NO
Communication Port	YES	OPTIONAL
International Power Supply	YES	NO
MS™-DOS 2.11	YES	NO
Graphics Display	YES	YES
Typical System Price	**$2995**	**$3710**

THE BEST LINE.

But the Tele-PC is only one element of the TeleVideo IBM PC Compatible line.

The TeleVideo XT is the best hardware for users of popular IBM XT software who would appreciate an extra 10 megabytes of storage capacity along with the advantages listed on the preceding chart.

As the chart above demonstrates, our portable IBM compatible computer, the TPC II, is far and away better hardware than COMPAQ.™ Better hardware—standard—at a better price.

THE BEST MANUFACTURER.

The TeleVideo IBM PC Compatible line is made by the world leader in multi-user computer systems and the number one independent manufacturer of terminals.

Our compatibles are available at participating ComputerLand and Entré (call 800-HI-ENTRE) dealers or you may call 800-538-8725 for the dealer nearest you. In California, call 800-345-8008.

Before you invest, make a few simple comparisons. You'll find that TeleVideo—not IBM or COMPAQ—has the best hardware for the best software. At the best price.

IBM is a registered trademark of International Business Machines. MS is a trademark of MicroSoft Corporation. GW Basic is a registered trademark of MicroSoft Corporation. COMPAQ is a trademark of COMPAQ Computer Corporation.



TeleVideo®
Personal Computers
TeleVideo Systems, Inc.
65501-21261

CIRCLE 347 ON READER SERVICE CARD

Qubie' gives you the three Pluses: Quality, Service, & Low Prices

"+++"

We were tempted to headline this ad with "The 1, 2, and 3 of why you should buy AST from Qubie'." We are as tired of ads with that logo as you are, so we settled on "+++." Actually, the plus really tells it better. The AST Research plus of quality is the reason they have the number one expansion products for the IBM PC. The Qubie' Plus of service has made us the largest dealer for AST products. You don't supply the likes of IBM, Exxon, General Motors, and Lockheed, unless you have premier products and service. Top it all off with low, Qubie' prices, and you have the reason tens of thousands of corporations, institutions, and PC owners have come to Qubie' for expansion products.

Take Your Choice

We have the range of multifunction boards for IBM PC's and compatibles that gives you the choice of functions right for your needs. The AST research MegaPlus II™ is the most flexible expansion product available for the PC. Its younger brother, SixPakPlus™ is the standard the competition measures themselves against. I/O Plus II™ is the answer for those who need serial and printer ports and automatic time and date loading, but already have their memory needs satisfied. MonographPlus™ is a multi-function monochrome graphics board. It offers the high resolution of the IBM monochrome board, along with flicker-free 1-2-3™ graphics, clock/calendar, printer port, and optional serial port. Standard with all four is the award winning AST SUPERPAK software. You get SUPERDRIVE™ electronic disk emulation and SUPERSPOOL™ print spooling software. All are backed with a 1 year parts and labor warranty.

MegaPlus II™			I/O Plus II™		
$329 Includes:	Options:		$149 Includes:	Options:	
Clock/calendar with battery backup Asynchronous communications port - RS232C serial - COM1 or 2 Memory sockets for up to 256K AST SuperPak Software & Q-Quick Menu	64k memory 2nd async port Printer port GamePak MegaPak 256k MegaPak 512k	$55 $35 $35 $40 $299 $199	Clock/calendar with battery backup Asynchronous communications port - RS232C serial - COM1 or 2 AST SuperPak Software & Q-Quick Menu One year Parts & Labor warranty	Game Port Printer Port 2nd Async Port	$35 $35 $35

SixPakPlus™			MonographPlus™		
$239 Includes:	Options:		$449 Includes:	Options:	
Clock/calendar with battery backup Asynchronous communications port - RS232C serial - COM1 or 2 Memory sockets for up to 384k Parallel Printer Port - LPT1 or 2 AST SuperPak Software & Q-Quick Menu	64k memory Game Option	$55 $35	IBM PC compatible Monochrome Card 720 x 348 1-2-3 compatible graphics Clock/calendar with battery backup Parallel Printer Port AST SuperPak Software & Q-Quick Menu	Serial port	$35

The Qubie' Plus

You can't be successful without providing good service. It starts with answering your questions before and after you buy. Since we only sell a few selected items, we have the information and the inventory to help you fast. We will ship your order the day after you call. And we're just as ready when something goes wrong. We will repair your board within 48 hours in our service department—not just be a relay point to the manufacturer.

Free Extras Too

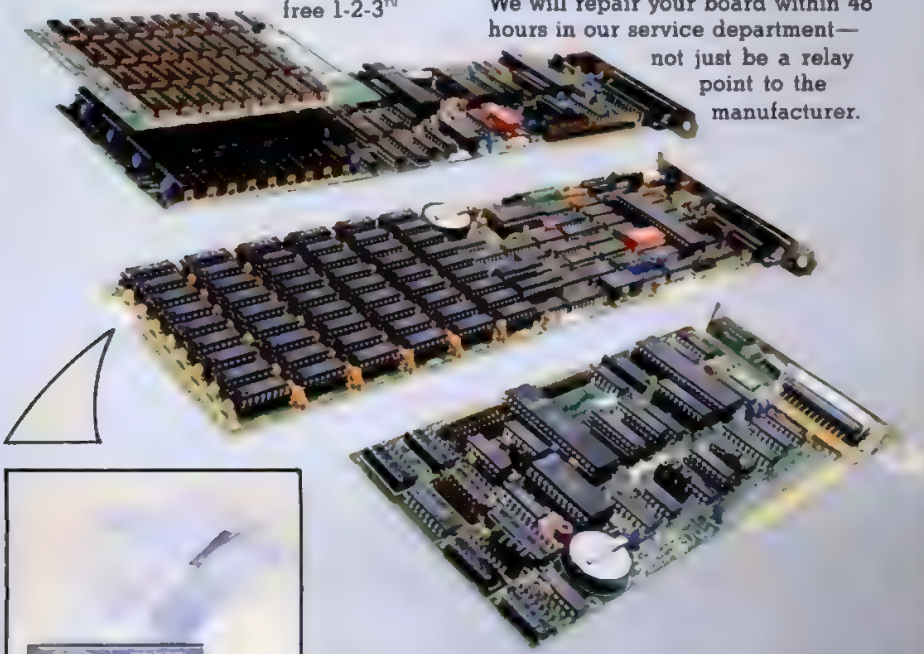
The Qubie' Plus also means no cost extras like the Qubie' bracket which allows ribbon cables to be mounted without interfering with other expansion slots. Or the Q-Quick Menu™ which provides easy arrangement of Superdrive's and the size of your SuperSpool printer buffer, without having to remember how the commands work. Both are Qubie' exclusives at no extra cost to you. And it's offering extra service when you need it like our PREFERRED CUSTOMER PLAN. For $50 extra the plan offers 24 hour repairs on warranty work, and gives you a second year of warranty coverage.

Don't Forget The Bottom Line

If you feel compelled to skim through the magazine and make a strict price comparison, remember, our price is the whole price. No extra charges for shipping, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra.

The Acid Test

If you are not completely satisfied with any Qubie' product after 30 days, you can return it for a full refund. We will even reimburse you for the postage to return it. If you can get any of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We know which one you'll keep.



Qubie' Bracket Free With Any Option

IBM is a trademark of International Business Machines Corporation
AST is a registered trademark of AST Research Inc

Order Today, Shipped Tomorrow!

All prices include UPS surface freight and insurance. Add $5 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

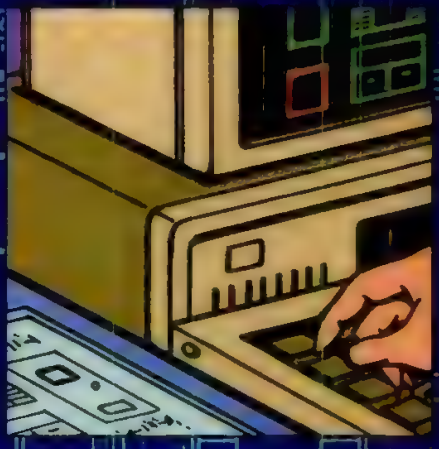
QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie' 1984

CIRCLE 334 ON READER SERVICE CARD



Getting the Picture with CAD

For years, computer-aided design has speeded drafting work for engineers, architects, and designers. Now CAD programs have made the move from minis to micros.

Illustrations: Brad Hammond

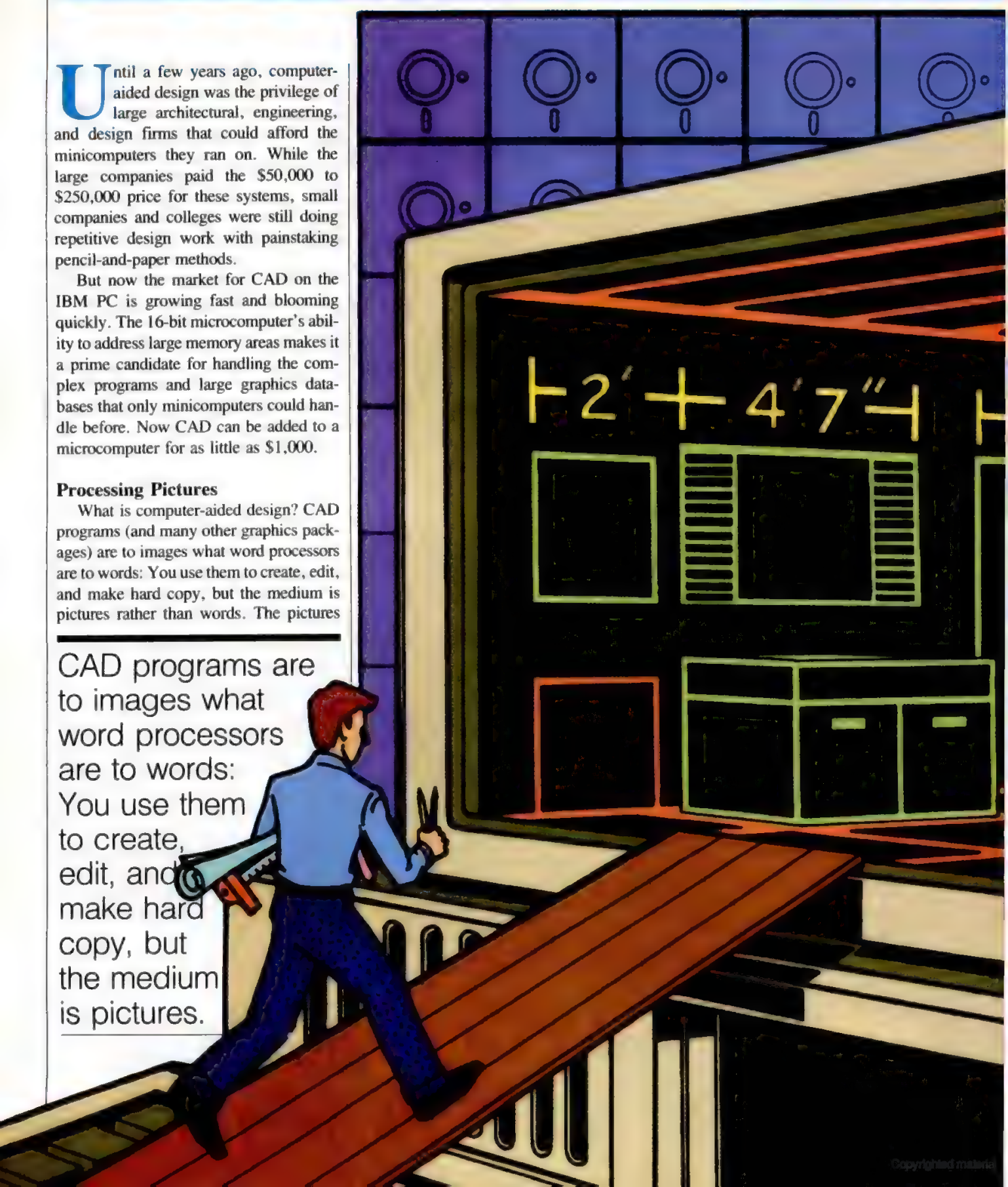
Until a few years ago, computer-aided design was the privilege of large architectural, engineering, and design firms that could afford the minicomputers they ran on. While the large companies paid the $50,000 to $250,000 price for these systems, small companies and colleges were still doing repetitive design work with painstaking pencil-and-paper methods.

But now the market for CAD on the IBM PC is growing fast and blooming quickly. The 16-bit microcomputer's ability to address large memory areas makes it a prime candidate for handling the complex programs and large graphics databases that only minicomputers could handle before. Now CAD can be added to a microcomputer for as little as $1,000.

Processing Pictures

What is computer-aided design? CAD programs (and many other graphics packages) are to images what word processors are to words: You use them to create, edit, and make hard copy, but the medium is pictures rather than words. The pictures

CAD programs are to images what word processors are to words: You use them to create, edit, and make hard copy, but the medium is pictures.

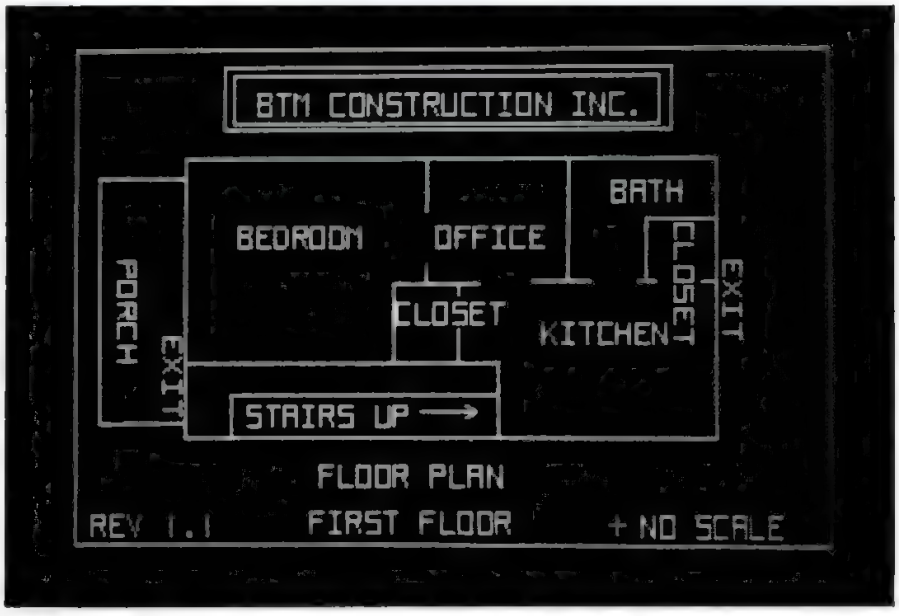


Copyrighted material





This *AutoCAD* screen of a floor plan demonstrates how the program can assign different colors to different layers.



A *VersaCAD* screen shows one layer of a simple residential floor plan. The drawing is not yet scaled.

may be created as ends in themselves, or they may communicate ideas, such as organizational diagrams or logos. A common use of CAD is to have a drawing conform to a drafting language—complete with notes, scales, and dimensions—to illustrate a design concept, such as a building to be built or a unit to be manufactured.

CAD programs that can create shaded 3-D images may be used to provide realistic simulations of how a design might appear before it is manufactured. A stored CAD database can also be used with engineering analysis programs to test the performance of a design under simulated stress. This feature alone, referred to as CAE (computer-aided engineering), can save designers dollars and hours by detecting problems while still in the design stage. Another application, CAD/CAM (computer-aided design/computer-aided manufacturing) uses a CAD database to drive programs and machinery that manufacture an object.

Is It Worth It?

CAD capability on the IBM PC may be limited compared to what larger systems can do, but a micro-based system can make sense on a price/performance basis. If 80 percent of large-system performance can be achieved with a micro-based CAD system, it certainly might be worthwhile to invest in a configuration that costs con-

AutoCAD, Version 1.4
AutoDESK, Inc.
2658 Bridgeway
Sausalito, CA 94965
(415) 332-2344
List Price: $1,000. Advanced drafting extensions (cross-hatching, dimensioning, sketch mode, partial line deletion, array command), $500. Program updates, $240.
Requires: 256K RAM, DOS 1.1 or 2.0, two floppy disk drives.

CIRCLE 664 ON READER SERVICE CARD

VersaCAD, Version 3.0
T & W Systems, Inc.
7372 Prince Dr., Suite 106
Huntington Beach, CA 92647
(714) 847-9960
List Price: $1,995 (includes 1 year free updates).
Requires: 128K RAM, two floppy disk drives, monochrome monitor with monochrome adapter card, color monitor with color/graphics adapter card, two RS-232 serial ports, digitizer, pen plotter.

CIRCLE 663 ON READER SERVICE CARD

siderably less than 80 percent of the larger system's cost.

Even if the system is not fast enough or not custom-tailored to your application, CAD still may offer decisive productivity gains over manual techniques. No matter what system is used, CAD gives the largest productivity gains on repetitive tasks, but speed isn't the only consideration. Added quality control, the ability to store drawings on disk, interface with other programs, and a computer that can double for word processing, structural analysis, and other tasks are gains to consider.

A small CAD system may also be useful in conjunction with a larger system. The small system can be used for less demanding drawing, for training, or to free the larger one for complex jobs. It could also serve as a preprocessor to the larger system if file compatibility is possible.

General-Purpose CAD Programs

Four companies have already tossed CAD software into the micro ring: AutoDesk introduced its *AutoCAD* package in 1982; T & W Systems introduced *VersaCAD* for the IBM PC in 1983, having already developed CAD packages for Apple II computers; and the two most recent entrants stepped into the picture in late 1983—Personal CAD Systems introduced its *CADplan* package, and BG Graphics offered its *Drawing Processor*. (For a detailed review of Version 1.30 of *CADplan*, see "A Day in the Life of CADplan," *PC*, Volume 3 Number 9).

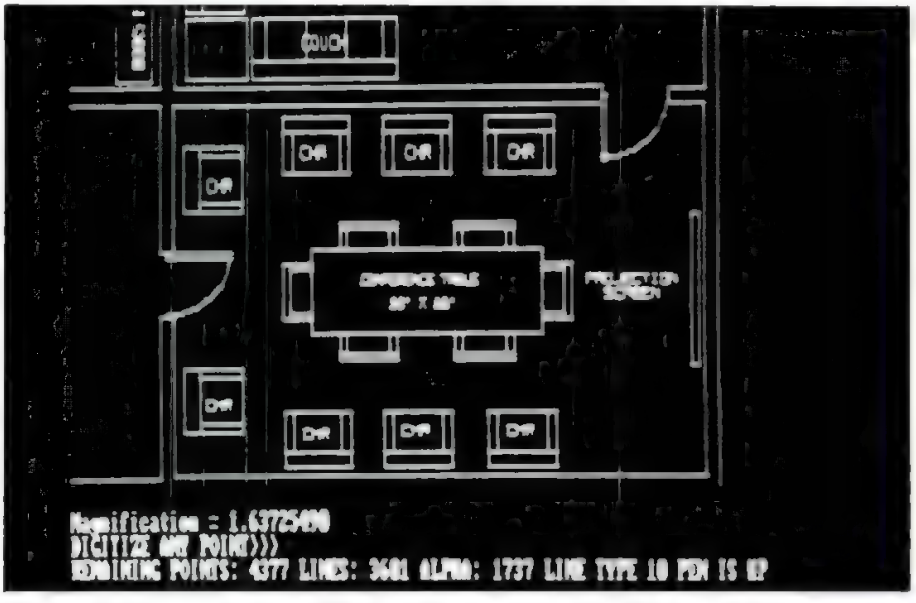
All of the packages fall into the general-purpose CAD category, which means that they provide drawing creation and

Drawing Processor, Version 1.01
BG Graphics Systems, Inc.
824 Stetson Ave.
Kent, WA 98031
(206) 852-2736
List Price: $995. Program updates for 1 year, $100.
Requires: 256K RAM, two floppy disk drives, color/graphics card, two RS-232 serial ports, digitizer, pen plotter.

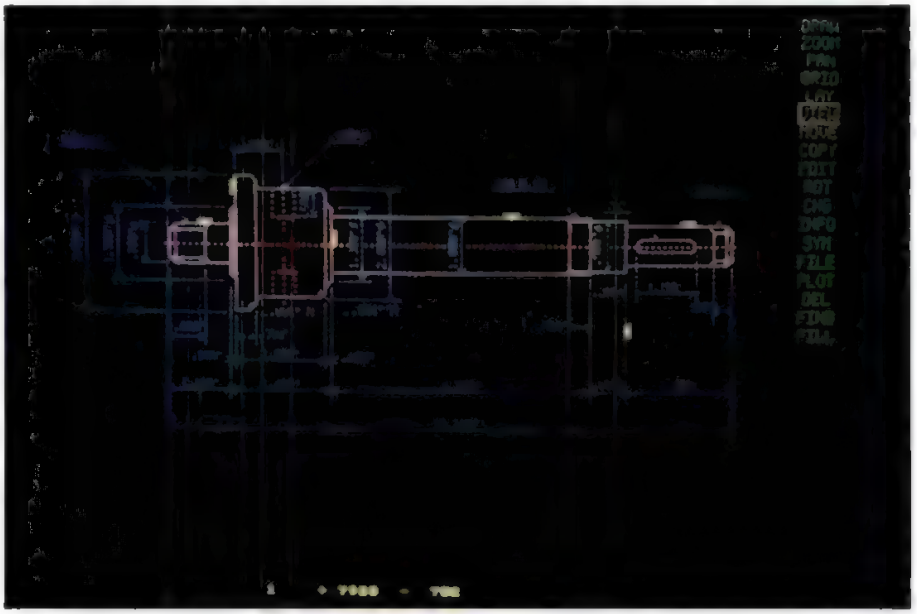
CIRCLE 662 ON READER SERVICE CARD

CADplan, Version 1.35
Personal CAD Systems, Inc.
981 University Ave.
Los Gatos, CA 95030
(408) 354-7193
List Price: $1,200. Database extraction option, $350. Dimensioning package, $250.
Requires: 320K RAM, IBM color/graphics card and color monitor, RS-232 serial port, mouse.

CIRCLE 661 ON READER SERVICE CARD



The furniture elements in this *Drawing Processor* layout may be stored in an object library and placed in drawings when needed.



***CADplan* creates this multicolored display of a gear when the View option is selected from the screen menu.**

editing tools common to many engineering or general graphics applications but are not specialized for any one particular discipline. All are menu-driven, two-dimensional CAD packages.

Floating-Point and Integer Formats

CAD programs typically store drawing elements, sometimes called "entities," in an image database. An important CAD program classification is the numerical format used for the image database. This format dictates the size of the world coordinate system with which images are described by the database (see sidebar, "Is It Really CAD?"). The larger the world coordinate system, the higher the potential resolution of the image and the more detail that can be stored. One of two numerical formats is commonly used: floating-point or integer.

If the program uses floating-point numbers, very high image resolution (as high as 1×10^{15} by 1×10^{15}) and accuracy are possible, although image storage and processing power needs are high. Also, because large amounts of detail are stored, you can zoom into sections of the drawing with ultra-high multiples of magnification.

Integer-based CAD programs, on the other hand, store lower-resolution images, usually around 65,000 points vertical by 65,000 points horizontal. Consequently, they use less memory for the database and usually run faster than floating-point programs, but some precision is sacrificed. Another possible disadvantage is that image rescaling may be performed by only fractional amounts, such as ½ or ⅛, and not by decimal amounts.

With a "zoom in" command, the program will map a small section of the drawing to the entire display, so you can focus in on details.

Integer-based programs are useful for applications that favor speed over precision, but they can still achieve a level of detail that's adequate for a wide range of applications.

AutoCAD and *VersaCAD* use floating-point format, whereas *Drawing Processor* and *CADplan* are integer-based.

Hardware Requirements

All four programs are written for the IBM PC, although the companies offer other versions for the XT and IBM PC clones, and some have versions for slightly more powerful computers. The chart, "Hardware Supported by the Four Programs," with this article lists computers and peripherals supported by each of the programs.

VersaCAD requires a dual-screen IBM configuration with both monochrome and color/graphics adapter cards. The monochrome screen is used for program status information and/or menus and the color screen for graphics, a desirable arrangement. *CADplan* uses the color graphics screen for status, menus, and display. *AutoCAD* and *Drawing Processor* let the

Glossing It Over

By way of introduction to CAD and its specialized language, here are a few essential definitions.

absolute coordinates: Coordinates based on points that are *x*, *y*, and *z* distances from a fixed origin.

aspect ratio: The ratio of image height to image width when displayed on an output device.

digitize: To input and register coordinate information about an image so that it may be processed by a computer.

digitizing tablet: A tablet with a cross-hair or stylus pointer that is used to input information about an image's coordinates.

entity: A drawing element, such as a line, circle, or arc, that is listed in a CAD database.

layers: Levels of a CAD drawing that can be superimposed on a display or plotter.

objects: Drawing elements, such as furniture components, that are stored in a graphic database and placed in drawings as needed.

pixel: On a raster display, the smallest resolvable point of a displayed image that can have a specified color or intensity level.

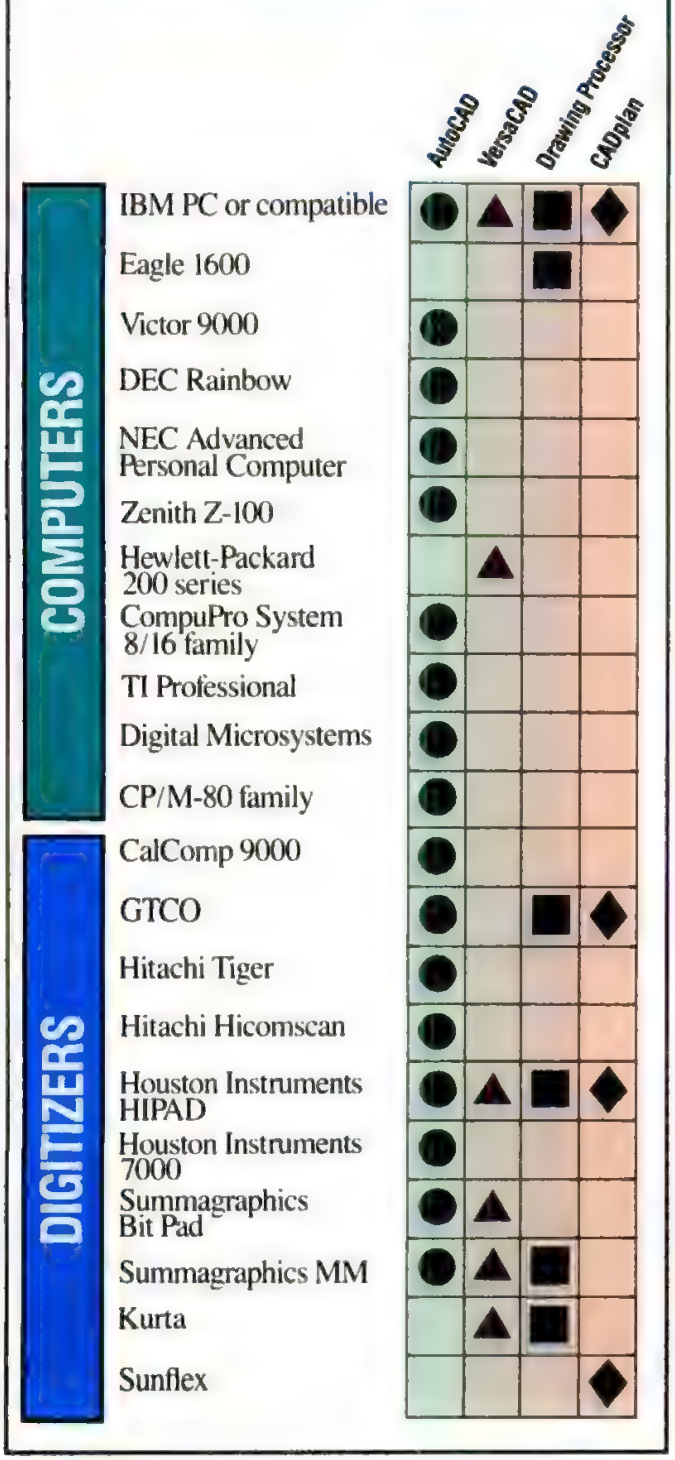
puck: The hand-held, cross-haired pointing device, used with a digitizing tablet to input data.

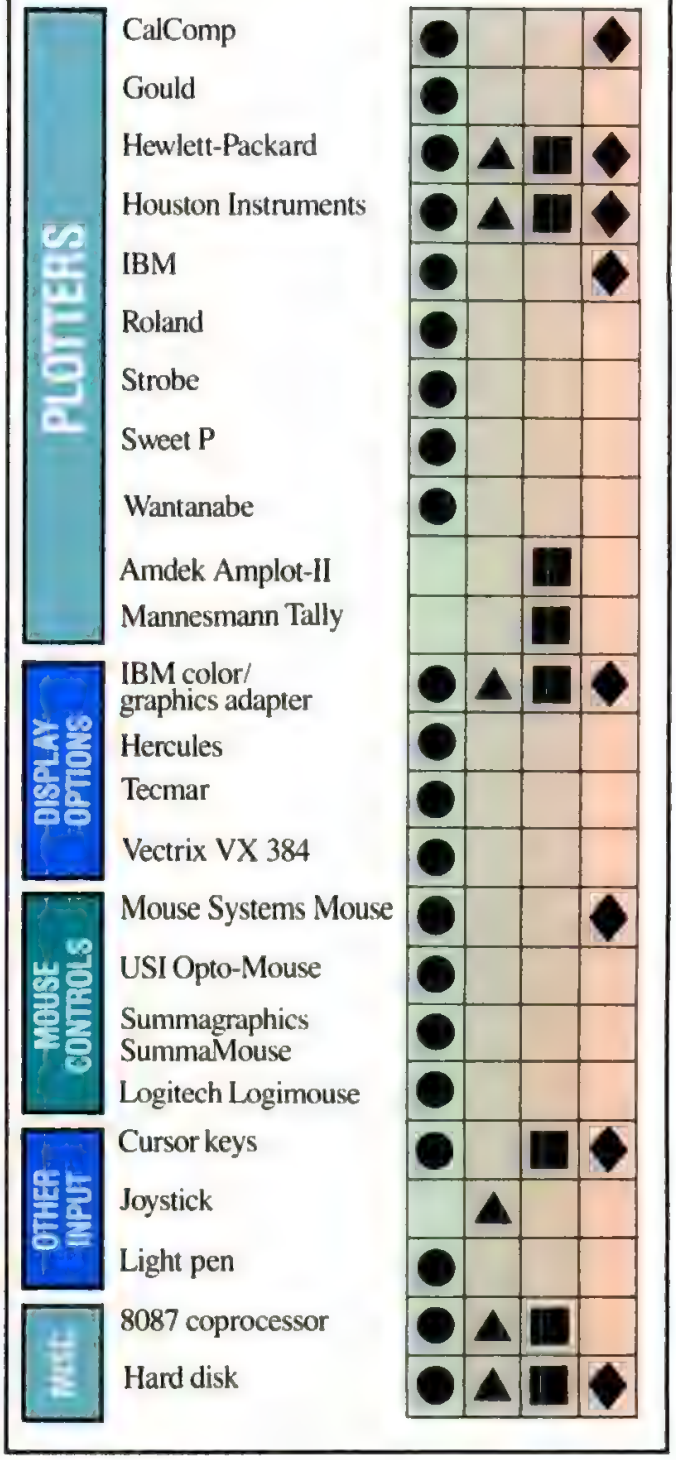
relative coordinates: Coordinates located in terms of *x*, *y*, and *z* distances from an unfixed origin.

rubberbanding: A CAD feature that creates a movable line, fixed at one end point, that contracts and expands to follow the screen cursor movements.

world coordinate system: A coordinate system unrelated to an input or output device.

HARDWARE SUPPORTED BY THE FOUR PROGRAMS





user configure the program for either a single- or dual-screen arrangement.

All programs except *CADplan* support the 8087 math coprocessor, and in most cases its use noticeably enhances performance. *AutoCAD* and *VersaCAD* can run without it, but it is highly recommended for *Drawing Processor*.

Objects and Layers

Two very powerful features of many CAD programs are object definition and software layering.

Object definition lets you create and store special objects or symbols and maintain them in an "object library." These objects could be drawing elements you would reuse frequently, such as logic gates, door swings, or furniture components. A good CAD program should let you create, store, and then place an object in a new drawing at any time. During placement, you should be able to scale, rotate, stretch, or repeat the object. After placement, an object may be edited in one of two ways: as a single entity (its component entities cannot be separated) or as the collection of its independent entities.

A CAD program should have utilities that let you keep track of what is in the object libraries and let you share object libraries between drawings. The ability to create a menu of frequently used objects on the screen or digitizing tablet may be convenient. Another feature, found only in *AutoCAD*, is the ability to nest objects within objects, but its use requires careful preplanning.

Software layering is another important feature of most CAD packages. You can think of this process as several imaginary Mylar overlays of superimposed drawings. Software layer 1 might contain a floor plan layout; layer 2 a structural plan superimposed over the floor plan; layer 3, a mechanical plan; and so on. The layers can all be turned on, or you may select only those you need at a given time. Layers can also be used to send information selectively to the plotter.

A good CAD program should support at least 30 layers and have the ability to switch entities and objects between layers once they have been defined. Only three of the programs reviewed fulfill these qualifications. *Drawing Processor* does not have a layer feature, but it does store special codes to let you isolate selected drawing parts at plot time.

A color monitor works well with the use of layers, but not all programs support color, particularly if they use the PC's high-resolution graphics, which are only available in monochrome mode. If color is used, it can be assigned to individual layers, which makes it easier to tell them

Is It Really CAD?

It depends on whether the program stores graphic data in a pixel-based or a vector-based format.

Many graphics programs are capable of creating and editing images, but there is a distinct difference between those that offer true CAD and those that do not.

Popular graphics programs are often pixel-based. Such programs store an image in memory in a format that resembles the computer's display buffer. The image conforms to a Cartesian coordinate system; its resolution, or x and y axis lengths, is limited to the horizontal and vertical resolution of the display system used. Stated another way, the number of pixels on the screen equals the number of bits that comprise the image.

When this stored image is transferred into the display buffer, a direct bit-mapping of display buffer bits to screen pixels puts the image on the screen. A bit turned on in memory will illuminate a corresponding screen pixel. A pixel-based program, in a sense, stores screens.

True CAD programs, on the other hand, store data in a vector, or list, format that is independent of any device, including the display system. With this technique, each individual component, or entity, of the drawing is listed in a database.

An entity could be an individual line, rectangle, circle, arc, ellipse, or curve. Each stored entity is listed by type, placement, size, and direction by x and y end points within a Cartesian coordinate system. The size of the coordinate system used is limited only by the numerical format of the computer language. Because the coordinate system is unrelated to any particular input or output device, it is sometimes referred to as the world coordinate system.

A pixel-based program might store a circle as a collection of points that describe its circumference. A vector-based program would store the circle as a command describing the entity type (a circle), a center point location, and radius length.

Pixel-based Pros and Cons

With a pixel-based program, the stored image resolution is the same as the display resolution, so the program may not take full advantage of devices that are higher in resolution than the display. For example, if a pixel-based image created on a medium-resolution monitor is sent to a high-resolution pen plotter, pixels will be plotted as points, and visible "jaggies" will appear in diagonal lines and in circles, even though the plotter is capable of much greater detail.

Another problem is that if the pixel-based program lets you magnify sections of the display, you will see more pixels devoted to the same drawing elements,

apart when they're all turned on. It is not necessary, however, to have a color display to achieve color on the plotted hard copy; different layers can be assigned to different colored plotter pens through software.

Getting Around on the Screen

How essential is high screen resolution? It's important, but not mandatory, because of the powerful zoom and pan features of CAD programs. If a drawing has too many points to be viewed clearly at one time on a low-resolution monitor, the display can instead be used as an adjustable "window" (called a "viewport" in CAD lingo) to view sections of the larger drawing. A pan command lets you move across the drawing to see different sections. With a "zoom out" command, you'll see a larger portion of the drawing with less definition; with a "zoom in" command, the program will map a small section of the drawing to the entire display, so you can focus in on details. Zooming in increases accuracy if you use the screen cursor to place points.

The ability to zoom and pan can make up for low resolution on the display.

Bear in mind that if you use a higher-resolution display system, there will be more pixels available on the display, and you can see more information clearly and place points more accurately without as much zooming. Also, for applications that rely heavily on the aesthetic composition of elements, the ability to see the "big picture" clearly would be helpful.

For Good Measure

Other features used as display aids are database units, temporary grids, resolution commands, and "snap" commands.

Before starting a drawing, you must first organize the world coordinate system into some convenient database units.

For example, you could relate the database units to feet and inches. If you are inputting a floor plan that is 100 feet long by 50 feet wide, you may choose your database units as 100 in the *x* direction and 50 in the *y* direction, and call them "feet." At plot time, the database units will be scaled so that the drawing will fit on whatever size plotter sheet you are using. Common architectural scales, such as 1 foot = ¼-inch, can be chosen. *(continued)*

but no additional detail.

Are there advantages to a pixel-based program? Certainly. Drawing storage and processing speed requirements remain constant no matter how many entities the image contains. Because the program isn't constantly scanning through a database, you rarely need to wait long for an image to regenerate on the screen after making changes. Pixel-based programs are sometimes referred to as paint programs, because they favor speed and spontaneity—good for freehand-style drawing—rather than precision. As higher-resolution monitors become commonplace, pixel-based programs will gain precision, although greater resolution will also mean that more memory is required to store each image.

The Real Thing

Vector-based CAD programs produce different trade-offs accompanied by their own set of advantages. Because the image database format is independent of any particular device, an image can be stored at a very high resolution; it can then be sent to any device, such as a pen plotter, at the device's full resolution. If a zoom command is used when the image is displayed on the screen, the CAD program will show more drawing detail, not just more pixels allotted to the same drawing elements. That's because the detail is stored at a resolution greater than the display.

Another advantage is that the program can add intelligence to a purely graphic database because drawing entities are "listed." Various line segments or line segment combinations residing in the database can be tagged by the program as wall segments, for example. Costs may then be tabulated if the program counts the total number of wall segments and multiplies by the unit cost. Taking this further, the graphic database can reference assorted information about the wall segment, such as unit cost, surface area, supplier, finish, color, or other specifications.

Finally, with the high accuracy of the stored database and a high-resolution pen plotter, the program can easily and accurately relate the coordinate system units used in the image database to some identifiable scale on the plotted hard copy, perhaps a fraction of a foot.

If you need to create scaled, accurate design drawings and tabulate costs or reference specs, or if you require accurate, plotted hard copy, your choice would have to be a CAD (vector-based) program.

There are drawbacks to CAD programs, too. Each new graphic entity requires an addition to the image database, so that a complex drawing results in a very large database. Substantial processing power and efficient code become crucial for scanning the database and generating the image—without them, operation will be sluggish and screen regenerations slow. Finally, truly responsive freehand-style drawing and editing are much less feasible with a vector-based program than with a pixel-based program. **—A.E.M.**

Another method might be to define the world coordinate system as 36 database units in the *x* direction and 24 in the *y* direction so as to relate to the size of a plotted 24-inch by 36-inch architectural drawing sheet. In this case, although the elements you input must conform to these units, you won't need to scale the drawing at plot time.

A temporary grid may be placed on the screen to give the operator a visual sense of the database units, and temporary drawing resolution can be defined. For example, if the drawing resolution is set at one-tenth of a database unit and used with a snap command, any points inputted with the screen cursor will automatically "snap" to the nearest point at that resolution. This lets you place points quickly with the screen cursor without constantly zooming in to check their exact placement.

One more important feature is the use of keyboard input for absolute or relative coordinate entry. By keyboarding the *x* and *y* coordinates of a point in database units or fractions thereof, the relatively low resolution of the display is bypassed, and extremely precise input can be achieved. Keyboard entry usually overrides any active resolution or snap commands.

The four programs support standard IBM PC graphics, but with variations. *VersaCAD* and *CADplan* support only medium-resolution graphics, and *Drawing Processor* supports only high resolution. *AutoCAD* lets you configure a system with either medium or high resolution, depending upon whether you favor color or better resolution. *AutoCAD* also supports several enhancements for graphic display.

Viewing commands that allow you to pan and zoom are important. As a database gets larger, the extra time required to regenerate an image after each pan or zoom can lead to "wait time." (Contrast this with larger systems that allow for almost instantaneous pan and zoom.)

To make the best of it, look for features that let you pan to previous drawing sections, zoom into windows or through a variety of scales, or otherwise simplify procedures. *VersaCAD* and *CADplan* are especially versatile in this respect—both allow you to define up to five different drawing windows and pan back and forth between them. *Drawing Processor* lacks a pan command; you can zoom out and then zoom in on a different section of the drawing for the same effect, but this involves an additional step.

Features that speed up image regeneration are also timesavers. For example, *VersaCAD* lets you temporarily toggle text lines to straight lines, because regenerating text after each pan or zoom can be slow. And both *VersaCAD* and *CADplan* provide efficient use of layers—if you switch off all currently unused layers that contain entities, the program speeds up, taking time only to scan and redraw entities on the active layers. *AutoCAD* offers noticeably less control by comparison; its database structure requires the program to spend time scanning entities residing on layers even if they aren't turned on. *AutoCAD* does let you temporarily toggle off all solid-filled areas to speed image regeneration.

> A program should be able to support several different types and brands of input devices, including mouse and digitizer.

Input Device Variations

There are two varieties of graphic input with a CAD program: Direct mode and Tablet mode. With the Direct mode, you create images directly on the screen using the screen cursor and graphic commands. You may use any input device, such as cursor keys, a joystick, a mouse, or a digitizing tablet.

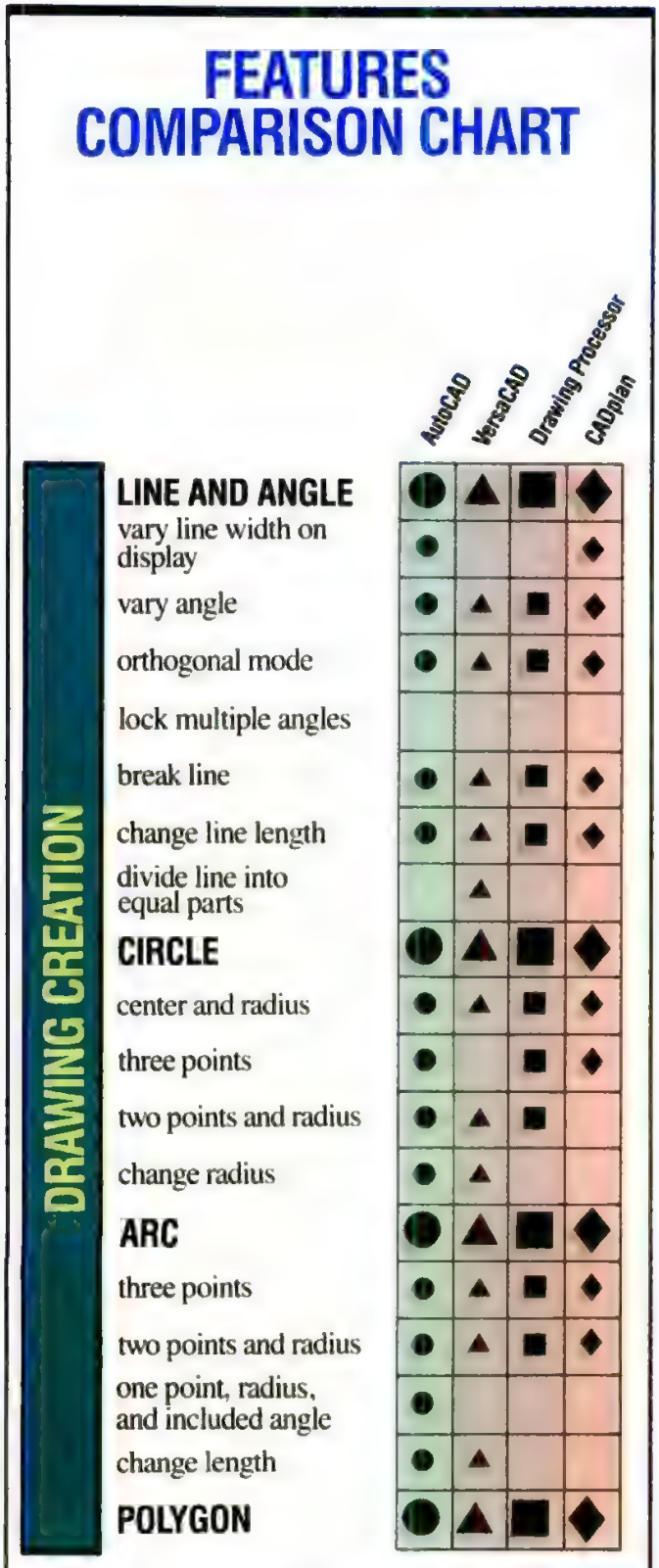
Tablet mode is used to input an existing hard copy drawing, and only the digitizing tablet may be used with this mode, because it is very accurate and uses absolute coordinates. You tape the drawing to the tablet surface, trace the drawing with the tablet "puck," and use graphic commands to enter the shapes while the image forms on the screen. Tablet mode lets you proportion the scale of the existing drawing to the database units used in the program and maintain the drawing's proper aspect ratio.

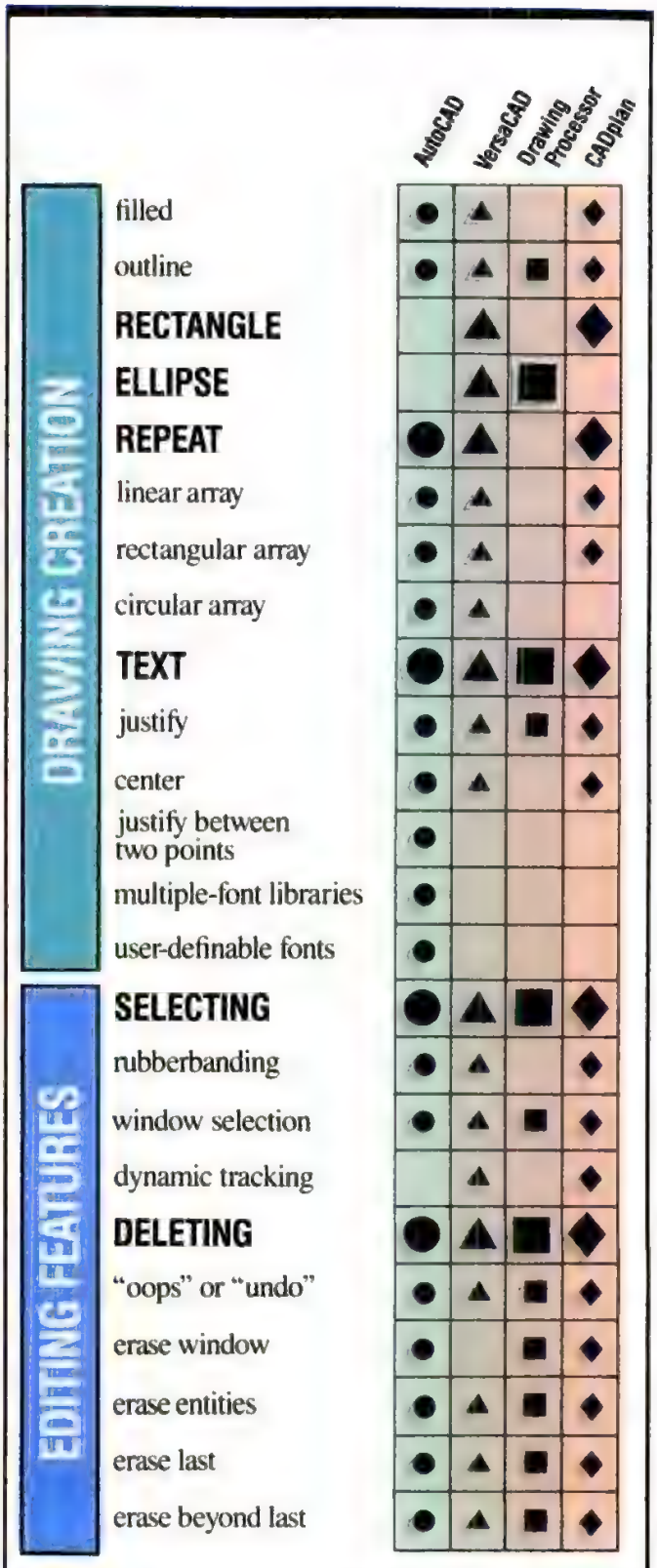
A program should be able to support several different types and brands of input devices, including mouse and digitizer. The Mouse Systems Mouse was used for this review, and it worked well. For a digitizing tablet, the Houston Instruments HIPAD was chosen for the review because it is supported by all four programs. (It's also one of the least expensive tablets around.) If a Tablet mode is needed for tracing existing drawings, or if you prefer to use a tablet menu rather than a screen menu, the digitizing tablet is essential. Some programs may also support the use of buttons on the tablet puck to choose or toggle certain commands. Bear in mind that a digitizing tablet requires special cables and a little more interfacing know-how than a mouse.

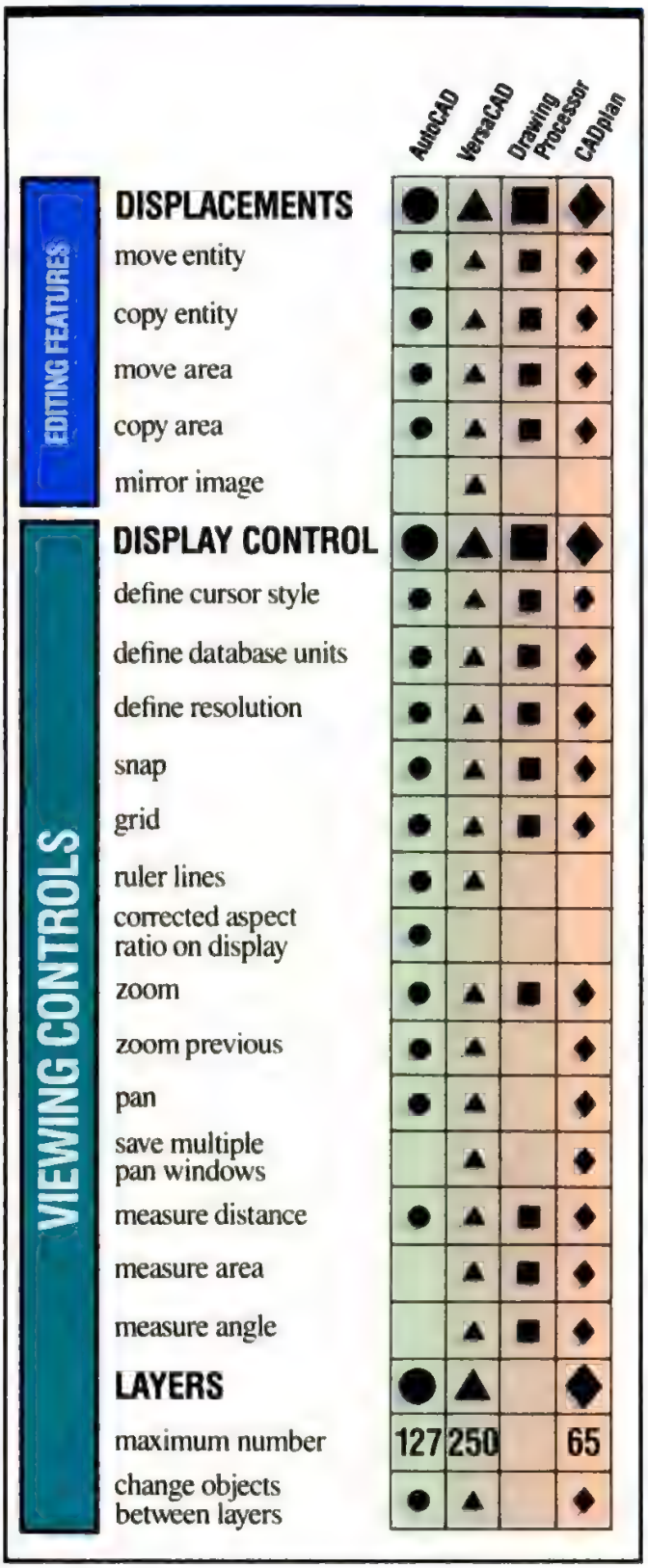
AutoCAD clearly shines when input devices are to be used. It supports the widest range of input devices, all of which can be configured by the user. This means that you can configure different disks and switch easily between, for instance, a mouse and a tablet.

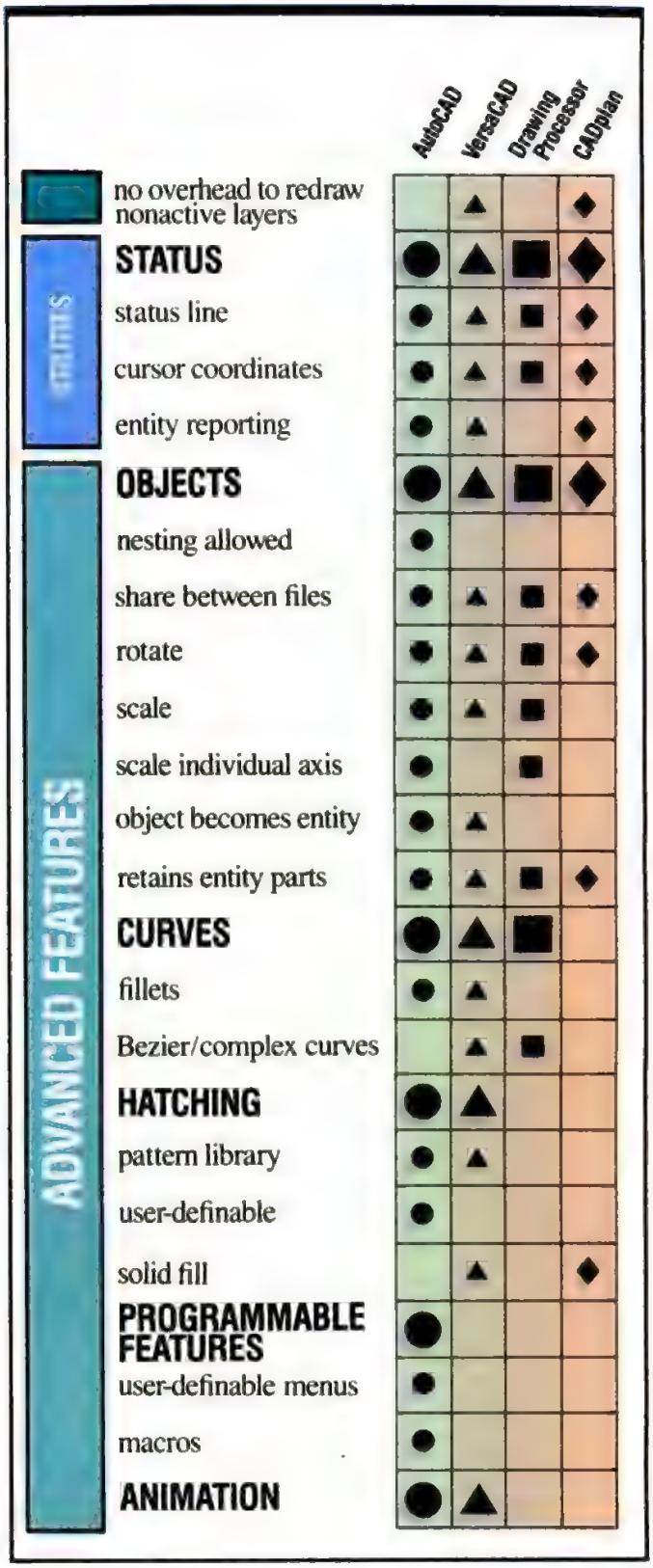
Using *AutoCAD*, the tablet puck may be used to point to the screen menu by configuring a menu directly on the tablet surface; this may give your eyes a break since they won't be constantly focused on the screen. *VersaCAD* supports digitizing tablets (although it doesn't support a tablet menu) and joysticks, but it lacks support for mouse and cursor control keys. *Draw-*

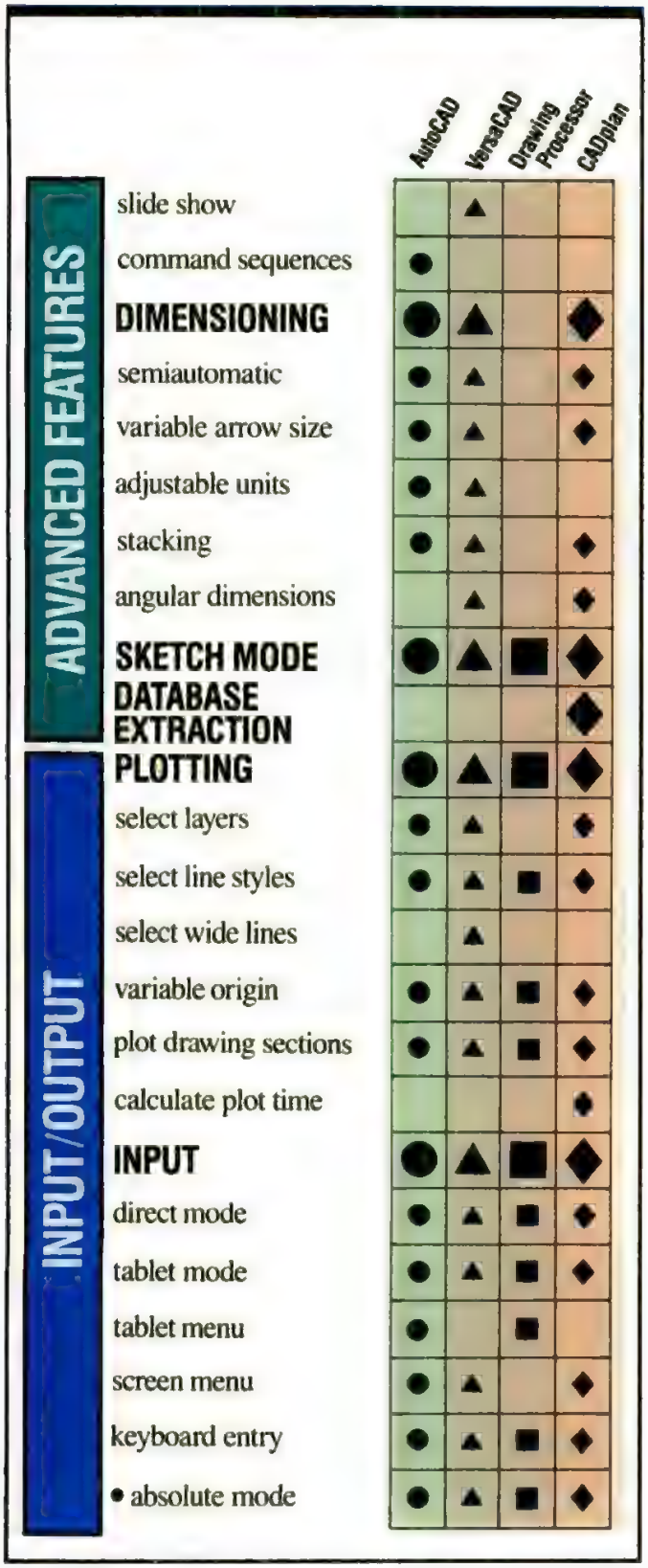
FEATURES COMPARISON CHART

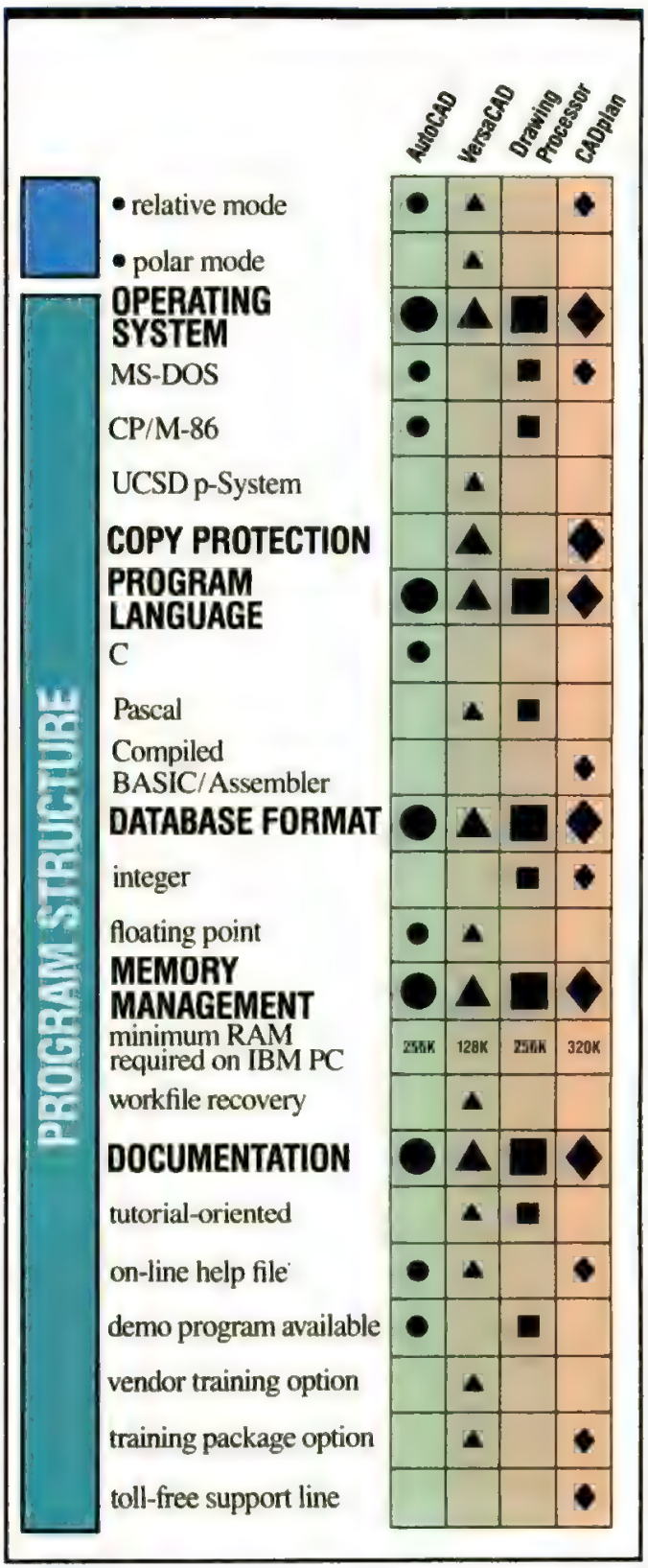





EDITING FEATURES
VIEWING CONTROLS
AutoCAD
VersaCAD
Drawing Processor
CADplan
DISPLACEMENTS
move entity
copy entity
move area
copy area
mirror image
DISPLAY CONTROL
define cursor style
define database units
define resolution
snap
grid
ruler lines
corrected aspect ratio on display
zoom
zoom previous
pan
save multiple pan windows
measure distance
measure area
measure angle
LAYERS
maximum number
127
250
65
change objects between layers


ADVANCED FEATURES
AutoCAD
VersaCAD
Drawing Processor
CADplan
no overhead to redraw nonactive layers
STATUS
status line
cursor coordinates
entity reporting
OBJECTS
nesting allowed
share between files
rotate
scale
scale individual axis
object becomes entity
retains entity parts
CURVES
fillets
Bezier/complex curves
HATCHING
pattern library
user-definable
solid fill
PROGRAMMABLE FEATURES
user-definable menus
macros
ANIMATION


AutoCAD
VersaCAD
Drawing Processor
CADplan
ADVANCED FEATURES
slide show
command sequences
DIMENSIONING
semiautomatic
variable arrow size
adjustable units
stacking
angular dimensions
SKETCH MODE
DATABASE EXTRACTION
PLOTTING
INPUT/OUTPUT
select layers
select line styles
select wide lines
variable origin
plot drawing sections
calculate plot time
INPUT
direct mode
tablet mode
tablet menu
screen menu
keyboard entry
• absolute mode


AutoCAD
VersaCAD
Drawing Processor
CADplan
• relative mode
• polar mode
PROGRAM STRUCTURE
OPERATING SYSTEM
MS-DOS
CP/M-86
UCSD p-System
COPY PROTECTION
PROGRAM LANGUAGE
C
Pascal
Compiled BASIC/Assembler
DATABASE FORMAT
integer
floating point
MEMORY MANAGEMENT
minimum RAM required on IBM PC
256K
128K
256K
320K
workfile recovery
DOCUMENTATION
tutorial-oriented
on-line help file
demo program available
vendor training option
training package option
toll-free support line

ing Processor supports only a digitizer (it uses a tablet menu but no screen menu) and cursor control keys, and *CADplan* is designed specifically to be used with the three-button Mouse Systems Mouse. The program also supports several digitizing tablets, but without tablet menus.

Output Devices

The pen plotter is the output device most commonly used with CAD programs. It accepts commands in a vector format at a very high resolution, a compatible feature for CAD. A graphic screen dump to a dot matrix printer is also possible, but, as with any graphic screen dump, the resolution of the printed image is as low as the display resolution.

The plotter driver should allow you to relate the database units used in the drawing to some unit of measurement on the hard copy, such as a fractional part of an inch or millimeter. The driver should also let you assign software layers to different pen colors or different line styles and widths. You must be able to plot the layers selectively if desired. The plot origin on the paper should be under software control. Features to let you plot the entire drawing or just a section are helpful.

The HP 7475A plotter, probably the highest performance "b" sized unit (approximately 10-inch 15-inch plot size) supported by the four programs, was chosen for this review. It was easy to interface and performed flawlessly. Because plotter cost rises dramatically with size, a high-performance "b" size plotter can be an alternative to a comparably priced, low-performance "c" or "d" size plotter. With good plotting controls in the program, large drawings can be assembled from smaller sections.

Evaluation

I can't help but be especially impressed by *AutoCAD*. It has many professional-level features, and even if you don't find the feature you want, you might be able to create it. Its user-definable menus, macro features, and support of numerous devices

A CAD Shopping Guide

There are myriad features and factors to consider when buying a CAD system. Draw your own conclusions about which ones are most important.

Even the less-sophisticated micro-based CAD systems can perform an astounding variety of tricks, and an important step when buying a system is deciding which features are essential for your application and which ones you can live without. Here's an overview of features to look for, with notes on how *AutoCAD*, *VersaCAD*, *Drawing Processor*, and *CADplan* handle them. (The features comparison chart gives a detailed list of what each of the four programs can do.)

Common Features

Drawing creation: CAD programs usually give the user a number of ways to draw and edit lines, angles, circles, arcs, and polygons. Lines may be shortened or lengthened, broken, or divided into equal parts. In some cases, the width of the line can be changed on the display or at plot time.

With most systems, you can pick end points with the screen cursor, and some programs also give you the option of keyboarding absolute or relative coordinates. Circles can be created by specifying three points, a center point and a radius, or two points and radius; arcs, by three points, two points and a radius, or one point, a radius, and an included angle; ellipses by major and minor axes. Polygons can be drawn in outline and, in some cases, with solid fill. A repeat or array function lets you make linear, rectangular, or circular arrays of entities or objects.

Text functions: The ability to adjust text height and angle of orientation, center text, and justify it between two points can greatly improve the appearance of an annotated drawing. If the program's text command supports multiple font libraries and lets you create your own fonts, all the better. Any additional word processing features aid the drawing process.

Editing features: "Rubberbanding" creates a movable line, with a fixed point at one end and the cursor at the other, that stretches and contracts on the display as the cursor is moved. "Dynamic tracking" lets you view the size and attributes of entities while placing them with the screen cursor so you can choose the placement that looks best before making a commitment on the drawing. Adjustable "windows" can be placed around areas on the display, and you can copy, move, or erase these areas or individual entities.

Commands that allow for partial deletion, changing an entity, changing vertexes, and breaking lines make drawing more spontaneous because you can change drawing elements without having to erase and recreate them. An "oops" or "undo" command to recover from erroneous input is essential.

Display control: Display control is enhanced when a program permits you to define database units and resolution and use snap, zoom, and pan features. An orthogonal mode resembles the use of a T-square and triangle in manual drafting, forcing all lines greater than 45 degrees vertical and less than 45 degrees horizontal. It speeds the drawing process by ensuring precise placement of horizontal and vertical lines. An orthogonal mode that lets you lock multiple angles for diagonal line placement is a plus for isometric drawings. The ability to change resolution at any time during the drawing

process is also convenient.

A status line or status utilities are essential to keep you informed about display controls that are active. Reporting utilities list coordinate data about existing entities and objects, such as end point coordinates, radii, and center points. Is the display aspect ratio corrected? If it isn't, circles will appear as ellipses on the display, and squares will look like rectangles (although they will appear correctly when plotted).

Pan and zoom commands will probably come in very handy for most applications—make sure they're easy to use. Being able to save previously viewed windows may also prove convenient. Finally, if the program requires extra time to scan entities on layers that aren't currently active, editing may be slowed.

Database file compatibility: Although proposed standards exist, the average program stores its database in an organization that is meaningful to that program only—files may not be interchanged with other programs. If the database format is documented, you have the option of writing a conversion program so you can use the database with another program, convert another database to your program, or write additional device drivers. *AutoCAD* comes with a special program to convert the database to an ASCII file and provides detailed documentation of the file format. Other vendors state that they will provide their database structure upon request.

File handling/memory management: Some programs adjust well to all available RAM, while others require RAMdisks or hard disks. Keep in mind that the number of entities and objects on a drawing may be limited by RAM size. And find out what happens if you overfill a disk—does the program abort, or do you get a warning? Does the program provide complete workfile recovery in the event of a system crash?

Advanced Features

Fillets, complex curves, and Bezier curves: Fillets create curves tangent to any two intersecting lines by choosing the two lines and a radius. Complex curve and Bezier commands are used to form connected series of curves tangent to each other or to other entities. *Drawing Processor* and *VersaCAD* are particularly powerful in this respect.

Hatching: The ability to fill enclosed areas with any one of a library of hatch patterns is a useful feature. *AutoCAD* provides for user-definable hatch patterns.

User-definable menus and macros: User-programmable menus let you group your own menus on the screen or tablet for a particular application. A macro feature lets you create a sequence of several menu commands that can be initiated by one command; preferably, you can add automatic pause within the sequence for user input. Both features can be put to good use—they help you customize the program for your individual application. For example, one macro can implement a sequence of menu steps to change resolution and grid size, toggle out of tablet mode, pan 20 database units to the right, and then insert an object.

AutoCAD is clearly the winner here; it's the only one of the four programs with either feature, and it has both.

Animation: The steps used to create an image can be saved in a special command file and replayed rapidly to create animated demos for products, services, advertising, and so forth. *AutoCAD* comes with this feature, which doubles as an automatic method of initiating commands at the beginning of a normal drawing worksession. An optional *VersaCAD* program lets you link screens together in sequence to create slide shows.

Database extraction: For certain applications, a database with user-defined specifications that can be referenced via the graphic database or object library is a particularly useful feature. Interior designers, for instance, could use it to store cost or supplier information about each piece of furniture in a building. *CADplan* is the only program of the four to offer this powerful feature (at extra cost).

Beyond Standard Features

Here are a few advanced features found on CAD programs for large systems, but not in any of the four reviewed programs. These features represent CAD at its best, but be aware that even many large systems don't have them.

Associative dimensioning: This is similar to semiautomatic dimensioning, except that existing dimensions are automatically updated if a drawing part changes size.

Dimensioning: All of the programs except *Drawing Processor* offer semiautomatic dimensioning features to notate sizes of drawing elements. This feature lets you choose where the dimension lines go, and the program automatically measures the distance and writes the dimension text. Additional features may include dimension stacking, angular dimensions, variable arrow size, or other features to add polish to the final drawing. You should be able to choose dimension units, such as feet and inches for architectural notation, scientific notation, engineering notation, and the like.

Sketch mode: A freehand-style mode for spontaneous drawing is available for all the programs reviewed. You won't get the response that a pixel-based paint program might provide, but you should be able to draw free of restrictions from structured drawing controls. A sketch mode is useful for accurately tracing irregular shapes such as land contours. *AutoCAD* clearly has the most advanced sketch mode. *(continued)*

and graphics resolutions give you flexibility to customize the program to match your needs. It has very sophisticated object handling, excellent memory management (it has the least frequent disk access of the four programs) and tremendous zoom capability. It's the only one of the four with the display aspect ratio corrected. Also, I personally favor a menu configured on the digitizing tablet.

AutoCAD has been through numerous revisions and is a mature product. It has good documentation and on-line help, but don't expect to be an old hand at using this feature-packed program within an hour.

Unfortunately, *AutoCAD* becomes sluggish on the IBM PC as the database increases in size, but it would probably perform well on a faster computer—this is true of floating-point programs in general. It would help tremendously if AutoDESK restructured the *AutoCAD* database so the program wouldn't waste time scanning entities on nonactive layers.

VersaCAD is also a mature program that's also loaded with sophisticated features. It has strong object handling, editing, and reporting features, and seems to be aimed at the professional user.

Although *VersaCAD* is extremely powerful and versatile, it lacks customization features such as user-definable screen and tablet menus, graphics resolutions, macros, and definable fonts and hatch patterns. But if *VersaCAD* has the features you need and supports the devices you have, you may not miss these customization features.

CADplan is integer-based and the fastest of the four programs, even without the 8087 chip.

VersaCAD does have Bezier curve and ellipse commands, and unlike *AutoCAD* it doesn't get bogged down scanning entities on nonactive layers. Its powerful dynamic tracking feature (see sidebar, "A CAD Shopping Guide") makes the program very interactive and a pleasure to use. *VersaCAD* is the only program of the four with a workfile recovery feature, but this requires frequent disk access, which makes it more suitable for use with a hard disk. The documentation is thorough, and the company offers training programs at its location in California. Although *VersaCAD* is more expensive than *AutoCAD*, it

Parametric objects: Some programs for large systems provide objects that may be placed using parameters that require calculations. For example, an architectural package might provide a staircase as an object; when you place the staircase, you input the floor-to-floor clearance, and the program automatically computes and draws the staircase with the proper rise and run. A hip roof may be drawn automatically with its proper slope after inputting floor-plan dimensions and heights.

The system might provide a programming language that allows calculations and loops so that the user may program his own parametric objects. This feature helps to customize a system to any given application and can greatly increase productivity.

3-D modeling: Once a plan and elevation view are defined, a perspective view of the object can be generated. 3-D CAD systems may be complicated to learn, and they require significant processing power if complex objects are modeled. (See "CS-5 Adds Depth to PC Graphics," *PC*, Volume 3 Number 13, for a review of a solid modeling system for the PC.)

Multi-windows: Some large systems use screen resolutions of 1,024 1,024 or more on raster monitors and use software windowing techniques for graphics. One window may show a floor plan, another may simultaneously show a perspective view of the floor plan, while another may show a furniture object library.

Once you've found a system that matches your needs and budget, consider the stability of the vendor. Most vendors revise their programs several times a year to keep up with competition. A hefty charge for revisions can add considerably to your costs. If a program lacks a minor feature you want but you are impressed by the vendor, there's still a good chance the feature might pop up in a later version.

Checking It Out

Check out the support the vendor has to offer. Is there a toll-free number? Is it always busy? Are there local dealers that can assemble a system for you and provide support? Are there training programs?

To determine whether the system is powerful enough for your needs, be sure to see a demo with a drawing of the complexity that you will be working with. Watch how quickly you can pan, zoom, and edit. Even if the speed is adequate, you may want to investigate whether the program is available for a faster computer, or if there are enhancements that will step up performance even more.

There are as many CAD features as there are applications with which to use them. But, as any computerphile knows, there is no substitute for hands-on evaluation. Most CAD program vendors give periodic demonstrations at sites across the country, and some have dealerships where you can try out a program for yourself. If you want to take a sampler home, AutoDESK offers a $50 demo package for *AutoCAD* that contains most features of the program (the hitch is that you can't save drawing files), and BG Graphics also offers a demo package for *Drawing Processor* for $100. —A.E.M.

includes many features as standard that are optional on *AutoCAD*, and revisions during the first year are free. The program is aggressively updated and should be a leading contender in the micro–CAD market.

Drawing Processor is easy to learn and use, has a good complex curve command, and has good object-handling features. The program emphasizes tablet-mode input, and although it has good direct-mode features, they appear a bit "vanilla" when compared to *AutoCAD* or *VersaCAD*. Also, in comparison with the other integer-based program, *CADplan*, *Drawing Processor* seems slow. It lacks layers, dimensioning, extensive device support, and some reporting features professionals might want. *Drawing Processor* has excellent potential; with a few aggressive updates, it could be a top performer.

CADplan is integer-based and the fastest of the four programs, even without the 8087 chip. The on-screen menu, status lines, and prompts are very friendly, and the program is probably the easiest of the four to learn. It's a powerful package, and if your application requires database extraction, this feature alone might be a reason to choose *CADplan*. Unfortunately, this program lacks a dual-screen option, object scaling commands, floating point, some advanced entity reporting, a tablet menu, and customization features, all of which might be useful for professional applications. *CADplan* is ideal for the infrequent user, for training and educational environments, or where speed is more important than precision.

If you already have an IBM PC, you can now add CAD to your existing computer system at a reasonable cost. This is a low-risk way to learn and grow with CAD at a pace that's convenient for you.

Allen E. Meilach is a Los Angeles computer graphic consultant specializing in architectural CAD, systems integration, and two- and three-dimensional graphic illustration. He has coauthored a computer dictionary and has won several prizes for computer artwork.



CIRCLE 148 ON READER SERVICE CARD

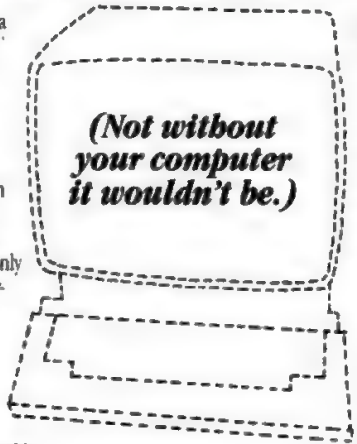
Business as Usual?

Business as usual these days means a computer that's up and "humming." But if your computer were stolen or damaged, you wouldn't have business as usual.

YOU'D HAVE TROUBLE!

You can get fast replacement for your entire system and be back in business in a hurry by protecting your computer with SAFEWARE Personal Computer Insurance. It's the only coverage designed specifically for personal computers used for business —in your office, shop or home.

SAFEWARE protects ALL hardware, ALL purchased software and ALL media against theft, damage or any other kind of loss, regardless of use, after a low $50 deductible.



Fast, courteous claims handling prevents your losing valuable business computing time.

Find the premium price for the coverage you need listed in the table below, *available for as low as $35 per year.* Fill in the coupon today. Your coverage will begin as soon as your coupon application is received. Or for even faster coverage, call our toll free number:

1-800-848-3469

(In Ohio call 1-614/262-0559)
Phones open 8 a.m. to 8 p.m., Monday through Saturday

SAFEWARE™

Total Hardware, Media & Software System Value	Annual Premium
Up to $ 2,000	$ 35
$ 2,001-$ 5,000	$ 60
$ 5,001-$ 8,000	$ 75
$ 8,001-$11,000	$ 90
$11,001-$14,000	$105

Call toll-free for rates on higher coverage. Coverage differs in Texas.
It is an underwriting requirement that you insure your system for its full value.

Mail to SAFEWARE, P.O. Box 02211, Columbus, OH 43202

Before I'm out of business,

please issue my SAFEWARE Insurance Coverage

Name _____

Street _____

City _____ State _____ Zip _____

System value $ _____ ☐Check Enclosed ☐VISA ☐MasterCard

Card # _____ Exp. Date _____

PCM


Copyrighted material

A Sporty Compatible

The MAD-1's high-tech look and its 80186 chip make it a Porsche in the Volkswagen world of PC-compatibles. Its careful design enables it to run most PC software.



From your first glance, you know that something is different about the MAD-1. Like a Ferrari, this new PC-compatible looks fast even while sitting still. A short test drive proves the worth of the sport car analogy. Up and running, the MAD-1's performance is as sleek as its looks, but its power is not achieved without cost. You trade advantages for the MAD-1's speed the same way you sacrifice luggage space and comfort for the sporty appearance of a Porsche or a Ferrari.

The MAD-1's speed comes from its 80186 microprocessor, which is faster than the PC's 8088. While it is therefore less-than-perfectly compatible with the PC, Mad Computer engineers have succeeded in making it compatible enough to run most PC software. (See "Lifting the Veil of Compatibility," *PC*, Volume 3 Number 6.)

Since the MAD-1's appearance is so striking, I began my review by looking over the outside. I then peeked under the hood, ran a few programs, and investigated the manuals.

The Outside

The MAD-1 is beautiful. It appears that more thought went into this machine's design than into those of any five of its PC-compatible competitors. The MAD-1 system consists of four components painted different shades of gray that give it a high-tech appearance.

The computer itself is in two parts, the Computing Module and the Data Module. The Data Module houses two half-height, 5-inch, floppy disk drives, and the Computing Module contains the memory, the processor, and other details. These pieces are both about 12 inches wide and 16 inches deep and are designed to sit one atop the other. They form a stack about 5½ inches high and together take up only two-thirds as much space as an IBM PC. Their beveled edges and dark gray color make them seem even smaller than that. The monitor is also 12 inches wide and is designed to sit on top of the stacked components. Deeper than most monitors, it has a tapered back nearly a foot long.

The keyboard is 18 inches wide, 6 inches wider than the other modules, and has 85 keys. It is a medium gray, with a deep wrist rest that makes it more than 8 inches deep in all. The main "typewriter" keys are light gray and the numeric keypad and the function keys dark gray. The legends on the keys are written in black, white, or red lettering.

The keys themselves are laid out in a manner fairly familiar to aficionados of Big Blue's machine. The manual describes it as similar to that of the IBM PC, except that the keys are "more conveniently" arranged. The function keys are set in two groups of five in a row at the top left edge. The troublesome Backslash key has been moved out of way to the upper left-hand corner next to the Esc key so that you now find the left-hand Shift key where you expect it. (That is, unless you have grown accustomed to its place on the IBM layout.) The CapsLock key has a light on it, so you can tell if it is on or off.

Unfortunately, the NumLock key does not have such a light. The designers also made it large and long and put it on the right edge of the main keyboard area. As a result, it looks and feels just like a Return key. Since it doesn't have a status light, you can't tell what state the numeric keypad is in after you have hit the NumLock key by accident a few times.

The MAD-1 keyboard's other quirk is its sound. The keys feel pleasantly resilient, giving you good feedback. Unfortunately, this feedback seems to be created by small springs in each key that make a "sproing" sound with each keystroke, a mechanical noise that you can't turn off as you can the keyboard sounds of other computers. Since different keys make different sounds, a fast typist sounds like a pogo stick orchestra performing a symphony. A Mad Computer representative says that the company recognizes this problem and plans to change keyboard mechanisms, but will probably not do so before the end of 1984.

A stroll behind the system yields some nice surprises. On the back of the Computing Module, I found the connector for the video display, a modular telephone plug socket, and three 25-pin D connectors. One of the three is a parallel interface, and the other two are serial ports. These "extras" are standard on the MAD-1. The phone plug socket is there to support a planned communications option that has not yet been released. I also found a connector on the bottom of the Computing Module labeled "Light Pen," although this plug is not mentioned anywhere in the manuals.

The Data Module has a power switch, a reset button, and a power connector for the video display. Perhaps the connector on my evaluation machine was damaged, but it seemed to me that the plug pulled out too easily and could disconnect itself if you slid the monitor around too much.

The plugs and cables on the MAD-1 bear witness to its careful design. The plugs and sockets have matching geometric shapes marked on them that make assembling the components a snap. The manual explains the process clearly, but I doubt anyone would need the manual for this step.

Under the Hood

Even without getting too technical, the MAD-1 has a number of interesting and important features inside its attractive packaging.

After you remove two screws from the back of a Module, you can easily slide the top back and lift it off to gain access to the machine's insides. You will notice that the



MAD-1
Mad Computer, Inc.
3350 Scott Boulevard, Bldg. 13
Santa Clara, CA 95051
(408) 980-0840
List Price: $4,195 for dual floppy disk version; $6,295 for hard disk version.

CIRCLE 798 ON READER SERVICE CARD

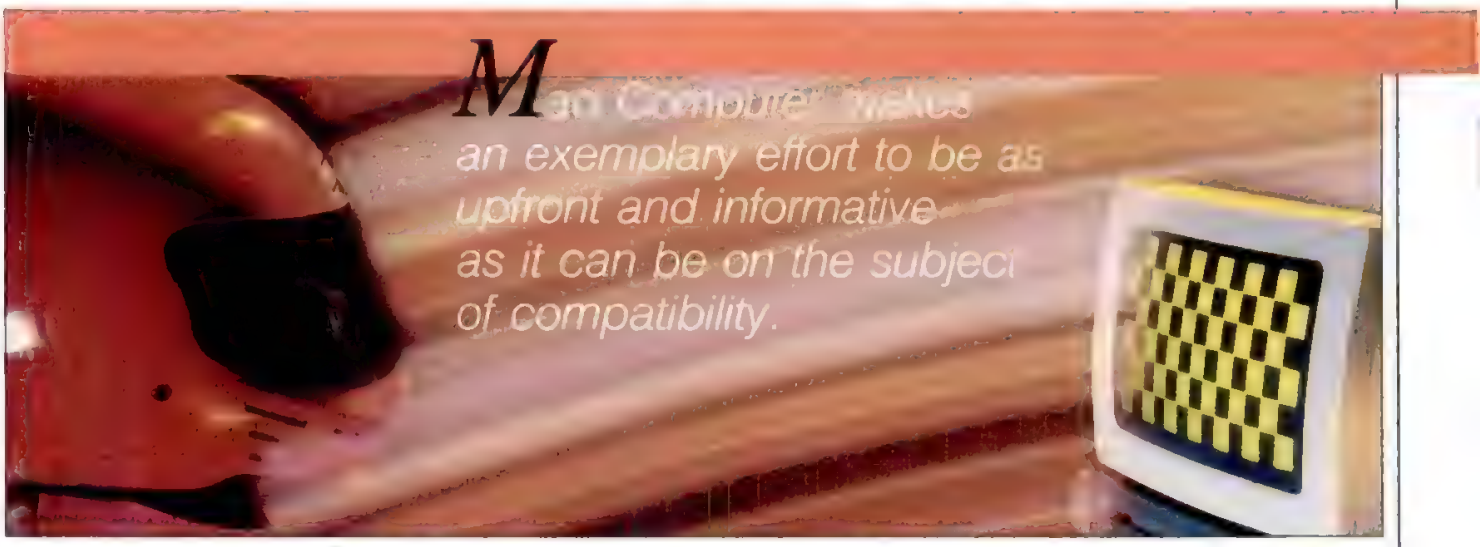
Photography: Peter Angelo Simon

sides of the modules are all louvered and essentially open to the elements. While this design permits excellent ventilation (only the Data Module has a fan, and it is small and quiet), I would hesitate to install a MAD-1 in even a slightly unhospitable environment. Dust and airborne debris could easily coat the insides and cause heat and other problems.

According to the manual, you may use just about any card you wish, except memory expansion cards. (You also wouldn't add a clock/calendar card, since that function is built-in.) If you want the extra memory beyond 512K, you will have to fill the slot with Mad Computer's memory card. If you have a hard disk version of the MAD-1, however, this single slot will be filled already by the controller. (The hard disk is a 10-megabyte, half-height drive that takes the place of one floppy drive.)

Mad Computer has addressed this problem of not enough slots and will soon be offering an expansion module (no price set yet). It will not use the existing slot and will add four more. This lack of expansion space is the price you pay for such a sporty style; you are limited on headroom and may have to get a trailer to carry all the things you want. The expansion module "trailer" will not have a hard disk option, but if you add an external hard disk, third-party products should be compatible.

This raises the inevitable question, "How compatible is the MAD-1 with the IBM PC?" Mad Computer makes an exemplary effort to be as upfront and informative as it can be on the subject of compatibility. In the *User's Guide*, an appendix devoted to the issue discusses different types of compatibility. For example, it claims that MAD-1 is "media compatible" and that it has a compatible keyboard and character set. It will accept any IBM expansion cards except memory cards. The operating system, the manual says, is "substantially compatible," since it is a version of MS-DOS 2.0 written for the MAD-1. The manual claims some processor compatibility, but it points out that since the 80186 is faster (and "more reliable") than the 8088, there might be "timing problems for some PC programs" and that "programs that use instructions unique to the 8088 may or may not run on the MAD-1."



The MAD-1 comes with 256K of memory. According to a company representative, the designers included this much memory because the MAD-1 is targeted as a "serious business machine." The motherboard will hold up to 512K in 128K increments. You can add a memory board (only available from Mad Computer) that adds up to 192K more, bringing the total usable memory to a whopping 704K (64K more than the IBM PC 640K maximum).

The MAD-1's 80186 microprocessor is in the same family as the IBM PC 8088, but it is of a more advanced design (see sidebar, "*The Fast One*"). Not only does this choice of processors mean that the MAD-1 has fewer chips on its motherboard than the PC, but it also means that the computer is faster for most applications (such as the BASIC prime number benchmark program).

The Computing Module also has one slot for an IBM PC-type add-on card.

On the subject of software compatibility, the manual states that "any PC program that follows the operating system's rules is assured of running on the MAD-1." However, it says, if the program addresses the screen display directly, or relies on ROM instructions, it may not run. The manual lists about 50 programs that have been tested for compatibility, and the list includes *WordStar* (Version 3.2) *dBASE II* (Version 2.4) and Lotus' *1-2-3*. Originally, Mad Computer had planned on licensing its own versions of popular word processing and spreadsheet software packages; it has now canceled these plans. According to a company representative, since the machine is so highly PC-compatible, custom-label software is simply not needed.

(continued)

Summertime,

SOFTWARE

Alpha Software
Database Manager II ..... call
Apple-IBM Connection ..... call
Type Faces ..... call
ApTec *(for color Prism Printers)*
Rainbow Writer Color Text Formatter $119
Rainbow Writer Screen Grabber ..... 69.
Ashton Tate
dBase II ..... 289.
Friday! ..... 169.
Best Programs
PC/Personal Finance Program 65
PC/Professional Finance Program II 169.
PC/Fixed Asset System 297
PC/Tax Cut ..... 175.
Bible Research
THE WORD *(KJV Bible - 7 disks)* ... 145
Broderbund
Bank Street Writer 59
Bruce & James
WordVision 39
Continental
Home Accountant Plus 89
FCM *(was First Class Mail)* ..... 79.
UltraFile *(file/report/graph)* 119
The Tax Advantage 39
Digital Research
CP/M-86 ..... 39.
Dr.LOGO *(requires 192k & RGB monitor)* 69
Financier
Financier II *(was Personal Series)* ... 115.
Financier Tax Series ..... 97.
Funk Software
Sideways 45
Hayes
Smartcom II ..... 99.
IUS
EasyWriter I System
EasyWriter I, EasySpeller I, EasyMailer I 159

EasyWriter II System
EasyWriter II, EasySpeller II, EasyMailer II
..... 195.

EasySpeller II *for EasyWriter II* 59
EasyMailer II *for EasyWriter II* 59

Accounts Receivable ..... 295.
Accounts Payable ..... 295.
General Ledger 295
Inventory 295
Order Entry ..... 295.
Package Price for any three above .. 859.
Payroll 359
Lifetree
Volkswriter ..... 115.
Volkswriter International ..... 135.
Volkswriter Deluxe *(with TextMerge)* 175.
Lotus Development
1-2-3 *(version 1A)* ..... call

PC Connection Software Special
through July 31, 1984

MICRORIM
R:Base 4000 (new version 1.1)
- Fully relational database
- 1 billion record capability
- Improved programming capability. $299

Extended Report Writer
- Expands report capabilities of standard report writer
- Allows full captions, headlines, and page breaks $85

Clout
- Permits you to query database in plain English $125

Micropro
WordStar & ProPak come with quick lesson CAI training disk and tutorial disk
WordStar 3.3 ..... $235.
ProPak *(WordStar/MailMerge/ CorrectStar/StarIndex)* ..... 369.
Microrim
R:base 4000 ..... *see special*
Extended Report Writer ..... *see special*
Clout ..... *see special*
Micro Data Base
Knowledge Man *(requires 192K)* 275
Microsoft
Multiplan *(new ver 1.2)* ..... 139.
Multi-Tool Financial *(for Multiplan)* 69
Multi-Tool Budget *(for Multiplan)* 99
Microsoft Word *(new ver 1.1)* 239
Microsoft Word *(new ver 1.1 with mouse)*
..... 289.
Microstuf
Crosstalk XVI 105
Infoscope 149
Transporter *(includes Crosstalk)* 169
PCsoftware
PCrayon *(create in full color)* 34
Executive Picture Show ..... 139.
CREATABASE 59
Peachtree
PeachPak Series 4 (G/L, A/R, A/P)
new version, IBM-size manuals 195
PeachText 5000 *(with ATI Training)* .. 195
Business Graphics System ..... 179.
General Ledger *(Series 8)* MS-DOS 375.
Accounts Receivable *(Series 8)* MS-DOS
..... 375.
Accounts Payable *(Series 8)* MS-DOS 375.
Inventory Control *(Series 8)* MS-DOS . 375.
Sales Invoicing *(Series 8)* MS-DOS .. 375
Job Cost *(Series 8)* MS-DOS ..... 375.
PeachPay *(Series 8)* MS-DOS ..... 375.

Peter Norton
Norton Utilities $55
Satellite Software
WordPerfect ..... call
Software Arts
TK!Solver 269
Financial Management Pack ..... 85.
Mechanical Engineering Pack ..... 85.
Software Products
Open Access 389
Software Publishing
PFS/File 89
PFS/Graph 89
PFS/Write 89
PFS/Report 79
Softword Systems
MultiMate *(w/spell checker)* ..... call
Sorcim
Supercalc 2 159
Supercalc 3 209
Virtual Combinatics
Micro Cookbook ..... 29.
Soups & Salads *(add on disk)* 15
Appetizers & Desserts *(add on disk)* 15.
VisiCorp
Visi On Manager ..... 69.
Visi On Calc 269
Visi On Graph 139
Visi On Word 259

The prices listed below are not misprints. VisiCorp has made a substantial cut in their prices.

VisiCalc IV *(w/StretchCalc)* ..... 159.
VisiFile 99
VisiSchedule 129
VisiTrend/Plot 69
VisiWord Plus *(with VisiSpell)* ..... 129.
StretchCalc *(for VisiCalc)* ..... 75.
Warner Software
The Desk Organizer *w/1 yr.free updates*
..... 179.

TRAINING

ATI
How to use Lotus 1-2-3 55
How to use Wordstar *(vol 1 & 2)* 55
How to use dBase II *(vol 1 & 2)* ..... 55.
How to use EasyWriter II 55
How to use Multiplan ..... 55.
How to use Your IBM-PC 55
How to use MultiMate ..... 55.
How to use Microsoft Word 55
How to use PC DOS 55
How to use TK! Solver ..... 55.
Individual Software
The Instructor ..... 35.
Professor DOS 47
Tutorial Set *(both items above)* ..... 75.
Professor Pixel ..... 47.

* DEFECTIVE SOFTWARE REPLACED IMMEDIATELY DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS
© COPYRIGHT MICRO CONNECTION INC 1984 ALL ITEMS SUBJECT TO AVAILABILITY PRICES SUBJECT TO CHANGE WITHOUT NOTICE IBM IS A REGISTERED TRADEMARK OF IBM CORP Jr CONNECTION AND MICRO CONNECTION ARE TRADEMARKS OF MICRO CONNECTION INC PC CONNECTION IS A REGISTERED TRADEMARK

PC CONNECTION®



PC Poolside

Over the river and through the woods.
By now it's obvious. PC Connection is the world's most personal purveyor of PC peripherals and programs, at very pleasant prices. Paws down.

But what many PC users don't know is that our sprawling multi-story (two, to be exact) corporate headquarters is located on the banks of the Ashuelot in rustic Marlow, NH (pop. 542).

On that very river, in millenia-old glacial pools, you may chance upon some of our employees, and the occasional small furry animal, cooling off after another hot day on the phone.

PC hardware, software, and leisure wear.
Our trained PC specialists are dedicated to helping you bring your PC to its pinnacle of performance.

Every day, rain or shine, we open the flood gates and ship wave upon wave of PC products downstream to every state in the country, and many of the countries in the world.

Disk drives, video boards, multi-function cards, modems, mice, amenities, and the best software programs in every category, from games to business.

Just give us a call or visit our showroom. We can put an end to any PC predicament. We're fast, reliable, and offer prices as low or lower than anyone else's.

And we can even help you make a splash in the up-and-coming world of microcomputer fashion.



Polo shirts from PC Connection. Limit one per customer. Offer not available to commercial accounts. Please specify XS, S, M, L, or XL.

Keep your shirts on.
Better yet, keep *our* shirts on. Stylish polo shirts designed exclusively for PC Connection by Oscar de la Racoona. Available in unisex sizes. Free to anyone who places a $500.00 order with us between now and September 30.

Just call 1-800/243-8088 or 1-603/446-3383 anytime Monday through Friday 9:00 to 9:00 and Saturday to 5:30. If you're planning to visit us, call ahead to make sure what you want is in stock.

For the IBM-PC exclusively.

PC CONNECTION®

iting is easy.

MonographPlus with clock calendar, serial & parallel ports. $429
Amdek
Video 300G Monitor *(green)* . . . . . 149.
Video 300A Monitor *(amber)*. . . . . 159.
Video 310A Monitor *(amber)*. . . . . 179.
Color II RGB Monitor . . . . . 439.
MAI Board *(color & monochrome)*. . . 399.
CompuCable
Plastic Keyboard & Drive Covers Set 17.
IBM Mono Screen Enhancement . . . . . 17.
Printer to IBM Cable *(specify printer)* 32.
Smartmodem to IBM Cable. . . . . 25.
Curtis
Low Profile Tilt & Swivel Pedestal *(for any monitor)* 44
PC Pedestal *(for IBM Mono or Color)* 55.
PGS or Quadchrome display adapter . . 9.
System Stand *(holds PC vertically)* . . . 21.
Extension Cables for IBM Mono Display 40
Keyboard Extension Cable *(3 to 9 feet)* 32.
AC Plug Adapter *(any monitor to your PC)* 8.
Electronic Protection Devices
All are rated at 1875 watts, 15 AMP.
The Lemon 39
The Lime . . . . . 59.
The Peach. . . . . 64.
The Orange . . . . . 94.
The Ground Hog *(static eating mat)* . . 69
Epson
RX-80 with GRAFTRAX-Plus . . . . . call
RX-80 F/T with GRAFTRAX-Plus. . . . . call
FX-80 with GRAFTRAX-Plus . . . . . call
RX-100 with GRAFTRAX-Plus . . . . . call
FX-100 with GRAFTRAX-Plus . . . . . call
Printer to IBM Cable (specify printer) 32.
FTG Data
Light Pen (Push Tip). 159
Demo Disk Set for Light Pen . . . . . 39.
Hayes
Smartmodem 300 209
Smartmodem 1200 . . . . . 499.
Smartmodem 1200B *(w/Smartcom II)* 409
Smartcom II . . . . . 99.
Compucable's Smartmodem-to-IBM Cable 25
Hercules Computer
Hercules Graphics Card *(parallel port)* 349.
Hercules Color Card *(parallel port)* . . 179.
Graph-X Software 42
IDS
Prism 80 Printer *(with all four options)* 1397
Prism 132 Printer *(with all four options)* 1597
Prism to IBM Parallel Cable 32
key tronic
Typewriter style keyboard (KB 5150) call
Deluxe keyboard (KB 5151) . . . . . call
Koala
Koala Touch Tablet *with software (connects to game port)* 89
Kraft
Joystick 39
Game Paddles *(pair)* 29

Maynard Electronics
Floppy Drive Controller . . . . . $165.
Internal Hard Disk (10 Meg), WS-1 Controller & ROM for PC mother board 995
Internal Hard Disk (10 Meg), WS-2 Controller & ROM for PC mother board . . . . . 1169.
Mouse Systems
PC Mouse. 197
NEC
Spinwriter 3550 *(IBM-PC compatible)* 1679.
Spinwriter 2050 *(3550's little brother)* 919.
Novation
Access 1-2-3 *(includes Crosstalk XVI)* 379
Paradise Systems
MultiDisplay Card *(color & mono)* . . . 379.
Plantronics/Frederick
COLORPLUS *(now w/Color Magic)* . . . call
Princeton Graphics
HX-12 RGB monitor *(690 x 240)*. . . . . call
SR-12 RGB monitor *(690 x 480)* . . . . . call
MAX-12 Amber monochrome monitor call
Quadram
We are a full line Quadram Dealer
New Expanded Quadboard 64k expandable to 384k, with clock calendar, parallel, serial & game port, I/O bracket, and Quadmaster software. . . . . 269.
Microfazer Printer Buffer (parallel) w/copy MP 64 (64k) *upgradable to 512k*. . . . 197.
Quadcolor I. . . . . 197.
Quadchrome RGB Monitor . . . . . 497.
Quadlink *(allows you to run most Apple II programs directly on your IBM-PC or XT)* . . . . . 459.
Quadisk *(various sizes to 72 meg)* . . . call
STB
Graphix Plus *(color & monochrome)* 297.
Silver Reed *(letter quality, 132 column)*
Silver Reed EXP 550 Printer (16 CPS) 589.
Silver Reed EXP 770 Printer (30 CPS) 950.
TG
Joystick 45
USI *(monitors for graphics board)*
Pi-2 Monitor (12" green, with cable) 119.
Pi-3 Monitor (12" amber, with cable) $129.

DRIVES

All drives are completely pre-tested. Specify Drive A or Drive B for your PC. Comes with complete step by step installation instructions.
Drives are 320K/360K.
Tandon
TM 100-2 (5 ¼") *full-height drive (DS,DD)* . . . . . 229.
TEAC
FD-55B (5 ¼") *half-height drive (DS,DD)*
Free 'y' cable & bracket each pair
. . . . . *see special*

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board. . . . . 59.
64k Memory Upgrade Set for any memory board *specify make of board*. . . . . 59.
Install memory upgrades & run diagnostics *at time of board purchase only* . . . . . 10.

DISKS

Verbatim *(with 5 year guarantee)*
Datalife Disks SS/DD *plastic box of 10* 26.
Datalife Disks DS/DD *plastic box of 10* 36.
Disk Drive Analyzer. . . . . 25.
Flip Sort *(holds 75 disks)*. . . . . 19.

INFORMATION SERVICES

Compuserve
Compuserve Information Service *includes subscription, manual, 5 hours of connect time, & monthly publications)* . 39.
Executive Information Service. 79
Vidtex Software . . . . . 59.
Executive Information Service with Vidtex . . . . . 119.
Source Telecomputing
The Source *(subscription & manual)*. . 69.
The Source *with* Sourcelink Software 109.

jr connection's on line.

Our new division, Jr. CONNECTION, is ready to serve you with the same kind of excellent products, prices, and support you've come to expect from PC CONNECTION. When you call Jr. CONNECTION, you'll talk to one of our trained PCjr. consultants. They've been working with junior for months. They know what add-ons you'll need for your application, and what software will run on your system. They can clear up any questions you have about junior, and get you up and computing in a flash. For your PC and XT, keep calling PC CONNECTION. For your PCjr., call Jr. CONNECTION — exclusively for the IBM-PCjr.

1-800/IBM-jr PC

PC CONNECTION®

CIRCLE 339 ON READER SERVICE CARD

and the compu

Typing Instructor $39
Lightning Software
Master Type 35

EDUCATIONAL

Davidson
Speed Reader II *(high school & college)* 49.
Math Blaster *(grades 1-6)* 35
Word Attack *(grades 4-12)* ..... 35.
Additional Data Disks for other ages are available for Speed Reader II and Word Attack at $15. each

FriendlySoft
FriendlyWare/PC Introductory Set .... 35.
Knoware
Knoware *(requires grapics board)*.... 67
Spinnaker *(All require graphics board)*
Educational Games for Young Computer Users

When you send 4 or 5 proofs-of-purchase to Spinnaker, they will send you the game of your choice FREE.

Delta Drawing *(ages 4 to adult)*..... 34
Snooper Troops I *(ages 10 to adult)* . 30
Snooper Troops II *(ages 10 to adult)* 30.
Most Amazing Thing *(ages 10 to adult)* 27
Face Maker *(ages 3 to 8)* ..... 23.
Kids on Keys *(ages 3 to 9)*..... 23.
Story Machine *(ages 5 to 9)*..... 23.
Fraction Fever *(ages 7 to adult)*..... 23
Kinder Comp *(ages 3 to 8)*..... 20
Rhymes and Riddles *(ages 5 to 9)*... 20.
Hey Diddle Diddle *(ages 3 to 10)*.... 20
Alphabet Zoo *(ages 3 to 8)*..... 20.
Stone *(requires graphics board)*
Great graphics and sound
My Letters, Numbers, & Words *(ages 1 to 5)* 29
Kids Stuff *(ages 3 to 8)* 29
Across the U.S.A. *(ages 5 & up)*..... 22

GAMES

Atarisoft
Centipede 29
Pac Man ..... 29.
Dig Dug..... 29.
Defender 29
Donkey Kong 29
EPYX/Automated Simulations
Temple of Apshai 27
Upper Reaches of Apshai..... 15
Curse of Ra 15
Star Warrior..... 27
Rescue at Rigel..... 23
Crush, Crumble, and Chomp ..... 23.
Blue Chip
Millionaire 45
Blue Giant
Hoser..... 25
FriendlySoft
FriendlyWare/PC Arcade 35

PC Connection
Hardware Special
through July 31, 1984

TEAC
Half Height Disk Drive 5 ¼" (FD-55B)
- Double Sided/Double Density
- Formats 320k w/DOS 1.1
- Formats 360k w/DOS 2.0 & DOS 2.1
- Fully IBM-PC (and XT) compatible
- Preconfigured for Drive A or Drive B
- Step by step installation instructions supplied
- Covered by 1 year manufacturers warranty $165

Free mounting bracket & 'y' power cable with each pair purchased.

LIFE IN THE PC FAST LANE

Our goal is to have what you want when you want it. On those rare occasions when we tell you we're out of stock, it means one of several things. The manufacturer is out of stock. A new, favorable review has created heavy demand. An announced product is still unavailable. Or, an updated version of the product is on the way, and we have no intention of selling an about-to-be-obsolete product (even if it means losing a sale). Whatever the reason, rest assured we'll give you as firm an availability date as possible.

OUR POLICY

- We accept VISA and MASTERCARD
- No surcharge added for charge cards
- Your card is not charged until we ship
- If we must ship a partial order, we never charge frieght on the shipment(s) that complete the order
- No sales tax.
- All shipments insured; no additional charge
- Allow 1 wk. for personal & co. checks to clear
- COD max $500. Cash or certified check.
- 120 day guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30

SHIPPING

Continental US: For monitors, printers, and drives, add 2% to all orders. For all other items, add $2 per order for UPS surface, $3 per order for UPS 2nd-Day-Air. We particularly recommend 2nd-Day-Air if you live west of the Mississippi or south of Virginia. In most cases it will only add $1 and will save you up to four days on delivery time. **Outside Continental US:** We add freight charges to credit card purchases. For prepayment, call 603/446-3383 for information

1-800/243-8088

PC Connection 270M
6 Mill St., Marlow, NH 03456
603/446-3383

Funtastic
Snack Attack II *(a favorite)* $27
Cosmic Crusader *(as good as above)* 27
Big Top *(climb to new levels)*..... 29
Master Miner *(1 or 2 players)*..... 29
Hayden Software
Sargon III 35
Infocom *High quality text games*
Zork I, Zork II, Zork III ..... *each* 27.
Starcross..... 27.
Deadline ..... 35.
Suspended..... 35.
Witness ..... 35.
Planetfall 35
Enchanter ..... 35.
Infidel..... 35
Microsoft
Flight Simulator *(new version)* 35
Orion
J-Bird *(you'll never sleep)* 29
PC-MAN 27
Paratrooper..... 25
Pits & Stones 29
PCsoftware
Armchair Quarterback 27
Chess 2001 27
Sir-Tech
Wizardry 42
Sierra/On-Line
Frogger 27
Crossfire *(keyboard or joystick)*..... 23
Ulysses and the Golden Fleece..... 27
Strategic Simulations
The Warp Factor ..... 27.
Tigers in the Snow 27
Galactic Gladiator..... 25
Epidemic..... 25.
Sublogic
Night Mission Pinball 29
Zoe Programming
Zuran Defender 25

HARDWARE

AST Research ***(For IBM-PC or XT)***
All AST Boards come with SuperDrive, SuperSpool, and one year warranty.
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports *(game port optional)*..... 269
MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar and serial port *(parallel, game, or second serial port optional)*..... 269
MegaPak 128k *(not upgradeable)*.... call
MegaPak 256k ..... call
I/O Plus II with clock calendar and serial port *(parallel, game, or second serial port optional)* 129
Parallel, Game, or second Serial Port *for any AST board (specify board)*... 39
Connectall *connector bracket (PC only)* 19
AST-5251 559
AST-3780 649

For the IBM-PC *Exclusively.*

PC CONNECTION®

Taking the MAD-1 for a Spin

Once thoroughly acquainted with the machine, I felt confident enough to turn it on and test it. First I had to take the monitor off its attractive perch atop the two other components and place it on the desk. (The machine I was testing was an early model, and the coil in the video display produced so large a magnetic field that it interfered with the disk drive if the monitor was sitting on the Data Module.)

I inserted the MS-DOS disk in the left-hand drive and closed the latch. The drives will not close without a disk inside, which makes it easier to tell when a drive is empty. I found it a bit of a reach around the back of the Data Module to get at the power switch. Once I turned it on, I was rewarded with the glow of the tasteful green power lights on the two Modules. Drive A: turned on, showing its green "in-use" light as it did so, and soon I saw a familiar MS-DOS notice and a question asking me about the date.

Since the MAD-1 has a clock/calendar built in, the date was already correct, as was the time. This feature is just one more example of the attention given to detail in the design of the machine.

The video display is a pleasant amber. It is difficult for me to evaluate the quality of the display because the test machine was in dire need of adjustment. The characters were decidedly fuzzy down the left edge of the screen, and the lines of the display definitely sloped downhill to the right. The character set appeared to be very good, but I suggest you look at a properly set-up machine first to judge for yourself.

The double-sided, double-density disk drives are extremely quiet and seem to be fast. They format disks to the same 360K capacity as the IBM floppy drives do under DOS 2.0. Interestingly, when you load a disk into a drive and close the latch, the disk starts to spin. If you don't access the disk right away, it will continue to spin for a short time and then stop. Apparently, the designers assumed that users access disks soon after they mount them. By starting the disk spinning right away, they save time for that initial access. I thought this feature was a nice touch.

I made some copies of disks and found that the FORMAT command and the DISKCOPY commands work quickly and efficiently. The DISKCOPY utility will format a disk for you when you make a copy, so there is no need to format the disk first. I then tried to load *WordStar*, using the standard, off-the-shelf version. It loaded in just under 7 seconds, which is on a par with the IBM PC's time. It also ran without a hitch.

My next step was to try a BASIC program that was used earlier this year to benchmark the speeds of IBM PC compatibles (see "A Garden of Portables," *PC*, Volume 3 Number 6). This program produces prime numbers from 1 to 50. When I typed BASIC, I received a File Not Found error message. Incredulously, I looked at the directory of the MS-DOS disk and found that no BASIC was included. Thinking that perhaps a second disk containing the missing files had been lost, I called Mad Computer. "Oh no," came the response, "GWBASIC is available as an option." And it costs $195.

I finally obtained a disk with GWBASIC that worked fine. I found that IBM BASIC also worked. With its faster 80186 chip, the machine blasted through the program in a mere 38 seconds, a race car time nearly one-third less than that required by most other PC compatibles.

I also tried a variety of programs from *PC Disk Magazine*. They all ran flawlessly, except for those requiring a graphics display. According to the MAD-1 manual, the circuitry for both monochrome and graphics displays are built-in, but you must get an optional "graphics kit" to take advantage of the graphics capability.

The Manuals

The MAD-1's high-tech design effort did not stop with the hardware. The two manuals come in the familiar boxed binders; the boxes and the binders share a bold

The Fast One

The 80186 is the faster, more advanced microprocessor many PC-compatible manufacturers have turned to for a marketing edge.

In 1978, Intel introduced the 8086, one of the first 16-bit microprocessors, and shortly after, the similar 8088, with an 8-bit data path and a lower price. IBM chose this cheaper chip for its new Personal Computer, and the rest is history.

The 8086 family now has at least four different chips, the 8086, the 8088, the 80186, and the 80188. Like the 8086, the 80186 has 16-bit internal and external data buses. It improves the original design by running a superset of the 8086 instruction set and requires about 20 fewer chips than a comparable 8086 design would. An 80186 running at a given clock rate should outperform an 8086 running at the same rate.

The 80188 is a similar improvement over the 8088. Like its forerunner, the 80188 has an 8-bit external data bus. Like the 80186, it has an enhanced instruction set and a higher level of integration so that it requires fewer supporting chips.

Mad Computer is not the only company to have chosen the 80186 for a PC-compatible computer. Tandy's TRS-80 Model 2000, the Pronto Series 16, and the new Mindset are all designed around the 80186. These four vary in their degree of compatibility with the IBM PC, a quality that cannot be measured by simply seeing what microprocessor is in the box. —**A.P.**

graphic design, but each manual has its own color stripe so you can match the binder with its box. Inside each manual, the chapters are separated by glossy graphics, all of which are variations on the same theme. The manuals' visual impact is unlike that of any others I have seen.

Mad Computer goes beyond making the manuals pretty. The text is easy to read and the authors use plenty of examples and illustrations. The *User's Guide* even lists the authors' names. The documentation seems so thoughtfully produced that it's only natural that the writers should be given credit for their contribution.

The User's Guide is organized so that you can read from start to finish and set up your computer as you go.

The *User's Guide* is organized logically so that you can read from start to finish and set up your computer as you go. You should have everything connected and running in short order and also learn something about the more detailed aspects of computing. This manual includes a chapter on what to do if the computer doesn't work correctly. It also has appendixes on MS-DOS messages and commands, technical notes, and the extensive discussion of the MAD-1's IBM PC compatibility. At the end, you will find a useful glossary and an index that seems to cover everything.

The other manual is a guide to MS-DOS 2.0. It covers the basic operating system concepts, files, and other disk-management topics. The bulk of the manual is a reference section explaining MS-DOS commands. It has chapters on DEBUG and EDLIN and appendixes with technical details on error messages, interrupts, and function calls. The index is apparently as thorough as the one in the *User's Guide*. The writing style in the MS-DOS manual is not quite up to the standard set by the *User's Guide*, but given its denser treatment of more technical subject matter, it still deserves high marks. I discovered one slightly unsettling omission, however. The command ERASE is available in this version of MS-DOS (as an equivalent to DELETE). The *User's Guide* documents this command, but the MS-DOS manual fails to mention it. I did not find any other omissions, but this one does raise lingering doubts.

The one complaint I have with the manuals is the way the pages are designed. They are long and skinny by usual standards: 6-x-9½ inches. The pages are laid out with a wide margin to one side, called a scholar's margin, which is used for section headings and user notes. Normally, these kinds of margins are on the outside of the pages, but in the MAD-1 manuals, they are all on the left side of the pages, which means the binder rings interfere with your note-taking on the right-hand pages. This is a small point; in general, the manuals are very good.

A Last Look Around

Like a sports car, the MAD-1 is an attractive, high-performance machine. Many extras that are considered luxury options on other computers are standard with the MAD-1. On the other hand, some features are quirky, and others (such as BASIC) are just plain missing. Expansion options are cramped, although the expansion module will help. The MAD-1 runs just about any software designed for the IBM PC (but not all) and can use expansion cards designed for the PC (such as networks, modems, and others).

Its price is comparable with a similarly outfitted IBM PC. Your decision is really between expansion slots and guaranteed software compatibility with the IBM, and high performance and good looks with the MAD-1. Mad Computer has made a strong case for choosing the sports model. ■

magnum p.c.

800-544-4354

MasterCard GA Residents (404) 441-3112 VISA

4056 WETHERBURN WAY SUITE 205 ATLANTA GA 30092

PRINTERS

RITEMAN	[illegible] LIKE EPSON BUT FASTER	BEST PRICE
C. ITOH	F10-40 CPS - LETTER QUALITY	1169
	55 CPS	SAVE
OKIDATA	ALL MODELS	CALL
NEC	SPINWRITERS	CALL
EPSON	MX, FX RX	CALL
TOSHIBA	P1350	CALL
SILVER-REED		SAVE
MICROFAZER	PRINT SPOOLER	CALL

DISK DRIVES

TANDON	TM100-2	CALL
	10 MEG HARD	1395
QUADDISK	6 MEG REMOVABLE	CALL
TECMAR	5 MEG REMOVABLE	CALL
IDEADISK	5 MEG REMOVABLE	CALL
MICRO SCI	XL (FOR APPLE)	187
DAVONG	CALL	CFX CALL

BOARDS

QUADRAM	ALL PRODUCTS	CALL
AST	LATEST BOARDS	CALL
IRMA	3278 EMULATOR	BEST PRICE
QUADLINK	EMULATE APPLE ON IBM-PC	CALL
TECMAR	ALL PRODUCTS	CALL
IDEASSOCIATES	ALL PRODUCTS	CALL
MA SYSTEMS	PC PEACOCK	CALL
IMAGE TECHNOLOGY	FUNCTION PAK	CALL

MONITORS

TAXAN	105 AMBER / 100 GREEN	109/104
	420 IBM RGB LOOK ALIKE	CALL
	RGB-III SUPER HI RES	CALL
AMDEK	310 DIRECT IBM PLUG IN - A OR G	CALL
	300 AMBER GREEN	154/144
QUADRAM	QUADCHROME	CALL

MODEMS

NOVATION - ACCESS 1-2-3	W/CROSSTALK XVI	CALL
	SMART CAT 300/1200	CALL
	J-CAT 300	117
	APPLE-CAT 300/1200	CALL
HAYES	SMART MODEM 300/1200	212/499
	1200B	CALL
ANCHOR	VOLKSMODEM	CALL
	SIGNALMAN MARK VII/XII	CALL
IDEA	IDEACOMM 1200	CALL
	IDEANET	CALL

SOFTWARE

MICROSOFT WORD	CALL	PEACHTEXT 5000	229
D-BASE	418	SUPERCALC 3	253
WORDSTAR	CALL	EASYWRITER	CALL
FRIDAY	194	MULTIPLAN	CALL
LOTUS 1-2-3	SAVE	MULTIMATE	CALL
GRAPH WRITER	CALL	CHART MASTER	CALL

ACCESSORIES

STANDBY POWER SYSTEMS	BEST PRICE
SWITCH BOXES PARALLEL & SERIAL	SAVE
CHIPS 64K	55
COMPUCHART PLOTTER TRANSPARENCIES & PAPER	CALL
KOALA PAD W/GRAPHICS ILLUSTRATOR	CALL
KOALAWARE FOR IBM	BEST PRICE
COMPUSERVE STARTER KIT	32

DISKETTES

		CASE 100	BOX 10
VERBATIM	SS/DD	180	24
	DS/DD	300	36
MAXELL	SS/DD	220	27
	DS/DD	330	39

AVAILIBLITY AND PRICES SUBJECT TO CHANGE

APPROVED CORPORATE ACCOUNTS WELCOMED

CIRCLE 386 ON READER SERVICE CARD



SandStar™ — Modular Technology That Will Never Obsolete Itself!

COMPLETE COMPATIBILITY
All SandStar™ Cards and Modules are designed to be 100% compatible with IBM hardware, operating systems, high level languages and diagnostics. They all come with a one-year repair or replacement warranty and are ready to ship.

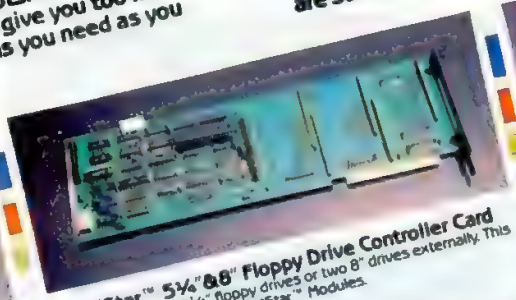
PRICED RIGHT!
All SandStar™ Cards and Modules are competitively priced. In the long run, the SandStar™ Series will save you money.

ASK YOUR DEALER
Look for the SandStar™ Series wherever quality computer products are sold. Watch our ads for new additions to the SandStar™ family.

SandStar™ Cards and Modules are the first IBM*-compatible peripherals engineered to be totally Modular. The ingenious design of the SandStar™ Series has virtually eliminated problems of board obsolescence and running out of expansion slots. Say good-bye to single function or "super" boards which either give you too little or too much. Now you can purchase the functions you need as you need them!



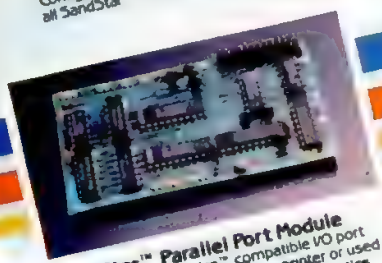
SandStar™ Multifunction Card
Configure your card with as many as six SandStar™ Modules. As with all SandStar™ Cards, all modules function independently.



SandStar™ 5¼"&8" Floppy Drive Controller Card
Control up to four 5¼" floppy drives or two 8" drives externally. This Card accepts up to three SandStar™ Modules.



SandStar™ Memory Card and Module
Expand your total system memory from 64k bytes all the way up to 640k bytes using only one card slot. In addition, this card accepts up to three SandStar™ Modules. Includes StarDisk™ Software



SandStar™ Parallel Port Module
This port is a Centronics™ compatible I/O port which may be used to connect a printer or used as a general purpose I/O port. IBM diagnostics will run on this module.

NEW!

SandStar™ SASI Host Adaptor Module
This module interfaces your PC to any SASI (or SCSI) compatible device such as the Xebec Hard Disk Controller

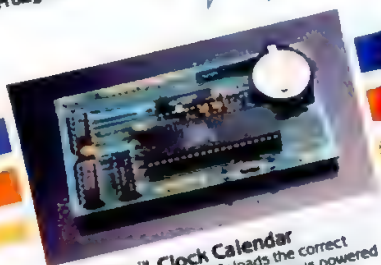


SandStar™ Serial Port Module
This module is totally compatible with software written for the IBM Asynchronous Adaptor and may be used to connect to a MODEM, serial printer or any device using a standard RS232-C interface. The port may be configured as Serial Port #1 or #2.



NEW!

SandStar™ Hard Disk Controller Module
This module provides an interface between your IBM PC and the industry standard ST-506 type hard disk drives. Includes ECC (error checking and correcting).



SandStar™ Clock Calendar
This module automatically loads the correct time and date each time the system is powered up. The clock and calendar are equipped with battery back-up and run even when the power is turned off. Software included.

NEW!

SandStar™ Prototype Module
This module can be used to create prototype designs which can be installed in the IBM PC.



SandStar™ Game Adaptor Module
With this module you can attach up to four paddles or two joysticks. It may also be used with four digital inputs and four analog inputs for general purpose graphic applications. It uses the same type 15 pin "D" subminiature I/O connector as the IBM Game Control Adaptor.

MAYNARD ELECTRONICS
400 E. Semoran Blvd. • Suite 207
Casselberry, Florida 32707 • 305/331-6402

We make modern times better.

*IBM is a trademark of the International Business Machines Corporation.

Antiques Courtesy of Lloyd Boughter, Orlando, Fla. Dealer.

CIRCLE 437 ON READER SERVICE CARD

Jack2 Sprints to the Fore

Business Solutions' new offering is off to an impressive start on the integrated software track. Though it may not outpace 1-2-3 in sales, it still finishes a winner.

The integrated software market keeps getting more crowded, but new products continue to muscle their way toward the top. Most of these offerings try to emulate Lotus' *1-2-3*, the integrated software leader, by centering their capabilities on spreadsheets. But *Jack2*, a novel new entrant from Business Solutions, Inc., is based instead upon a form, the electronic equivalent of a document, that would incorporate the functions of word processing, graphs, and spreadsheet data. Instead of integrating these functions as separate software entities, *Jack2* presents them as components in its flexible informational document.

Instead of switching environments, the *Jack2* user can simply insert any of the other functions into the text of the form. The fact that these various representations of data can coexist on the screen as a seamless whole, without the visual or intellectual distraction of windows, is *Jack2*'s principal distinguishing characteristic.

This is an alluring prospect, and *Jack2*'s backers have emphasized its potential with a series of highly publicized challenges against integrated software heavyweights, including *1-2-3* and Apple's Lisa system. Unsurprisingly, perhaps, *Jack2* has whipped the competition



Illustration: Richard Osuka

in its own test. Our test, however, resulted in mixed conclusions. The package does indeed have many strengths—enough to guarantee it a comfortable niche in the marketplace. But it has shortcomings, too. Accordingly, *Jack2* is not for everyone. To find out why, let's take a closer look at this new challenger in the integrated software derby.

Jack2 requires two disk drives and 128K of memory in order to run on the PC. It can be installed on a hard disk with the standalone XT installer package included with the program. Business Solutions, Inc., plans to offer an XT version of *Jack2* in the future. The compact *Jack2* package includes a disk of sample files and a *Tasks & Applications* manual that provides clear explanations of how to apply the software to a variety of common situations. Sample applications include checkbook balancing, check printing, product sales and salesperson performance, form-letter processing, projection, and scheduling.

As mentioned, with *Jack2*, various representations of data can appear on a single form. If you were manually composing a document that incorporated text, a numeric table, and a bar chart, you would not be restricted to writing your text on lined paper, your table on a green spreadsheet, and your chart on graph paper; you would combine them into a single form (see Figure 1). The same is true with *Jack2*. Its method of integration is intuitive, powerful, and pleasing.

Another strength of the *Jack2* package is its visual design. When you load the software, the screen displays a drawing of a desktop computer, which holds your attention while *Jack2* migrates from the program disk to memory. You need at least two disk drives for *Jack2*, and the program disk must remain in the booting drive during the *Jack2* session.

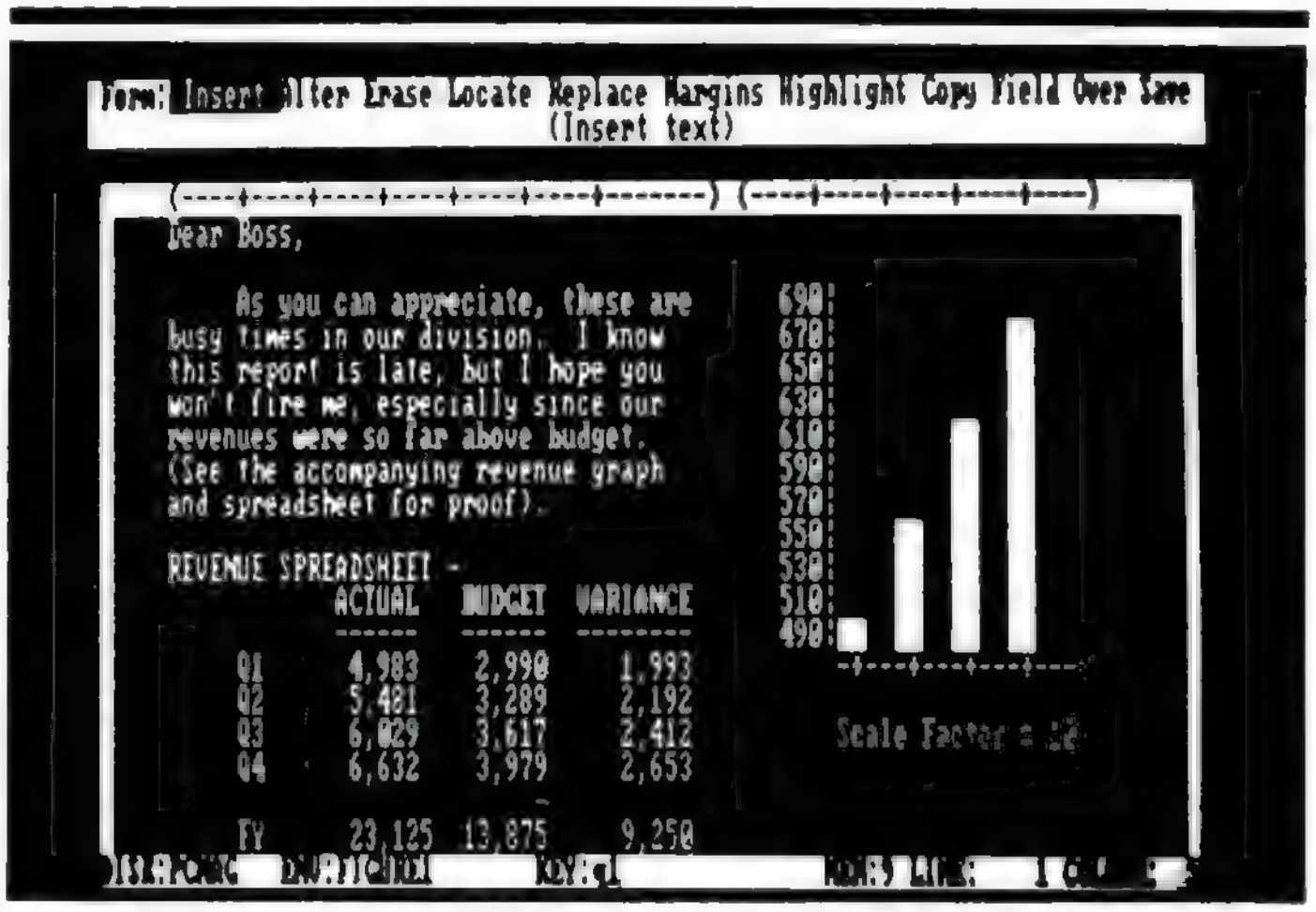


Figure 1: *Various representations of data, including text, numeric table, and bar chart, can be integrated on a* Jack2 *screen.*

Jack2
Jack2 Report
Business Solutions, Inc.
60 East Main St.
Kings Park, NY 11754
(800) 645-4513, (516) 269-1120
List Price: $495 *(Jack2)*; $250 *(Jack2Report)*.
Requires: Two disk drives, 128K RAM.

CIRCLE 679 ON READER SERVICE CARD

The Disk Screen

After the initial boot sequence, *Jack2* presents the Disk screen. The Disk screen displays icons representing the disks that currently reside in the drives. *Jack2* assigns names to the disks that you use to store *Jack2* forms. Figure 2 shows the Disk screen with two icons representing the *Jack2* program disk residing in the first drive and a data disk, named PCMAG, housed in the second drive.

The top section of the display contains the command line of the Disk screen. These commands permit you to copy one disk to another, erase or rename a disk, print a disk catalog, or configure *Jack2* for your particular hardware setup. There is also a ZOOM command that allows you to focus on the files contained within a single disk.

Notice the highlight on the ZOOM command in Figure 2 and the hint line below it describing the command being highlighted. Notice also the arrow pointing to the PCMAG disk. You can examine a particular disk by shifting the arrow to that disk and invoking the ZOOM command. Choosing a command involves pressing the space bar until the highlight eclipses the command you want, and then pressing the Enter key. Alternatively, you can type the first letter of the command.

Selecting ZOOM brings you to another screen of icons, the Envelope screen (see Figure 3). Like the Disk screen, the Envelope screen consists of a command line, a hint line, and a lineup of icons. The icons in this case are envelopes, *Jack2*'s equivalent of files. Any function or combination of functions, whether word processing, database, spreadsheet, or graphics, can be contained in one envelope. A disk icon on the right side of the screen shows which disk has been opened for inspection by the ZOOM command and how much disk space has been used up by the envelopes it contains. A disk can hold as many as 50 envelopes.

The Envelope screen can display up to six envelopes at a time. The arrow keys

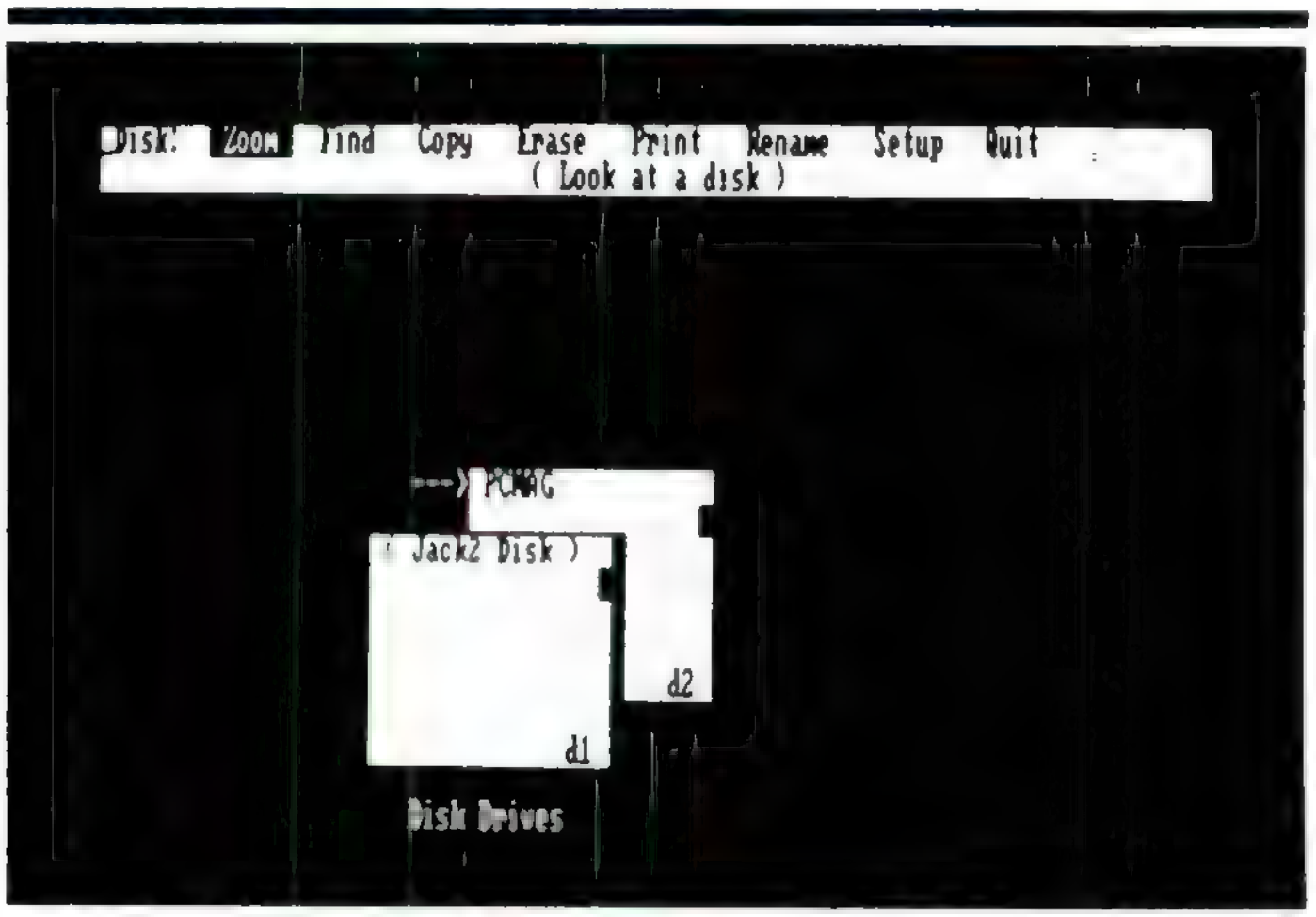


Figure 2: *This Disk screen displays two icons representing the* Jack2 *program disk and a data disk named PCMAG. Note the highlight on the ZOOM command.*

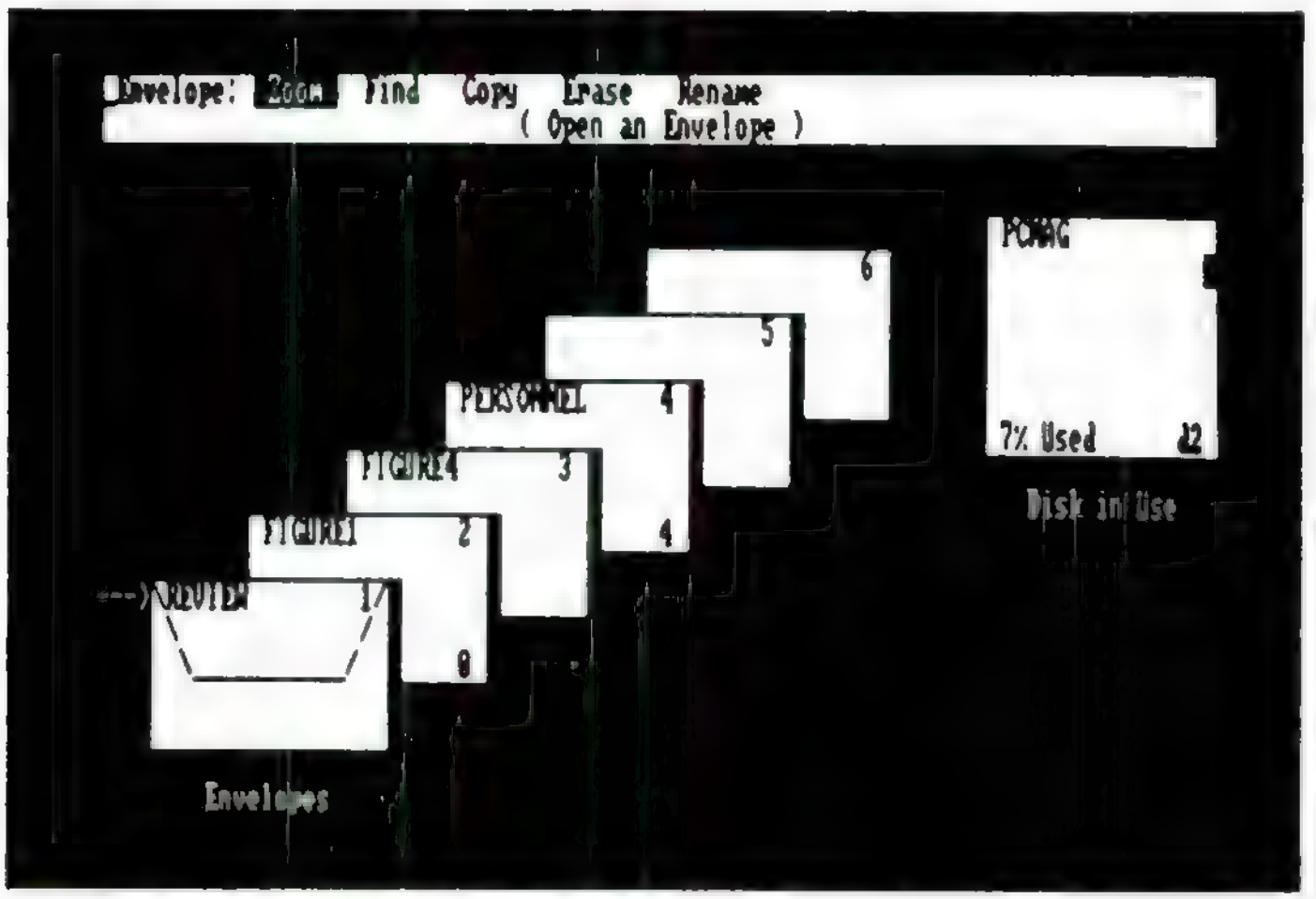


Figure 3: *Envelope icons such as these shown on an Envelope screen are* Jack2*'s equivalent of files. The screen can display a maximum of six such envelopes.*

permit you to scroll up and down the envelope lineup to view any 6 out of the maximum 50 envelopes. Here, too, there is a ZOOM command to open an envelope for inspection. You also can copy an envelope to another envelope on the same disk or to an envelope on another disk, erase or rename an envelope, or find a disk in the lineup by name, instead of by pointing.

You will notice that only some of the envelopes in Figure 3 have names on top. Blank envelopes are used to create new files or to store copies of existing files. Using the ZOOM command with an existing envelope accesses that file; using it with a blank envelope opens up a new file. ZOOM is one of several commands that appear in several screens and function similarly in each. Using the same command to perform the same operation in different contexts is one way *Jack2* achieves integration.

Using the ZOOM command to open an envelope invokes the Contents screen, which exhibits an icon lineup of the form and records contained in the envelope. If the envelope contains database records, you can point to a record and invoke the ZOOM command to inspect its contents. To create a new form in a new envelope, simply point to the form icon that appears on the Contents screen and use the ZOOM command. The Form screen on which you enter your document will then appear (see Figure 4).

You can use the Form screen for word processing or for any other function. *Jack2*'s word processing is one of its most capable features. Using the same type of command menu selection process described for the other screens, you can insert, alter, and erase text, locate occurrences of a string of characters within text, find and replace all or selected occurrences of a set of characters, copy and move text within and outside the envelope, and specify margins, tabs, and page-formatting options for all or part of the document.

The MARGIN command inserts a margin line in any part of the text. For example, you can create a document with one section that is 80 characters wide and justified on the left and right, another section that is 65 characters wide and centered, and another section that contains two columns of text side by side, magazine style. The maximum width for a form is 255 characters.

The Form screen also includes a HIGHLIGHT command. Text on the screen and in print can be emphasized in bold print, underscored, or both. The software includes printer configuration drivers for Epson FX, MX, and RX models, IBM

Treasure Chest™ of Software

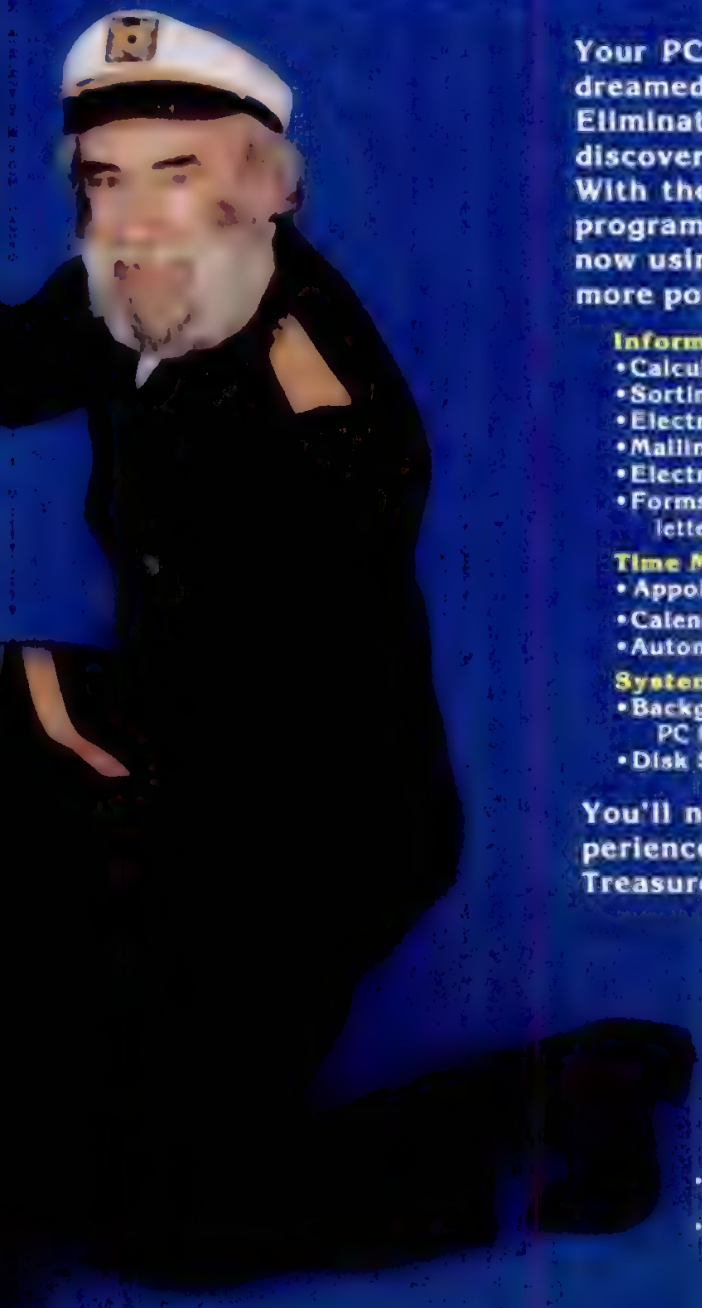
*jr*Captain™ and 1stMATE™



TECMAR

the power behind the PC™

with Tecmar's Captain™, multifunction boards



Your PC can finally do all those wonderful things you've dreamed about — with the Treasure Chest of Software. Eliminate the need for many desk top accessories when you discover Tecmar's new easy to use software technology. With the press of a key you access many Treasure Chest programs without having to exit from a program you are now using. This Treasure Chest of Software gives your PC more power for:

Information Management
- Calculator
- Sorting Program
- Electronic Rolodex*
- Mailing List
- Electronic Notepad
- Forms Generator - create letters, labels & reports

Time Management
- Appointment Alert
- Calendar Generator
- Automatic Time and Date

System Improvements
- Background Printing - frees PC for other work
- Disk Simulator in RAM

Hardware Diagnostics
- Memory Diagnostics
- Printer Diagnostics
- Clock-Calendar Diagnostics

Information Security
- Confidential File Coding

Use at Home
- Checkbook Balancer
- Inventory Management
- Banner Generator - prints letters 4.5 inches tall
- Tic-Tac-Toe
- **and more !**

INTRODUCTORY OFFER

*Rolodex is a trademark of The Rolodex Corp.

You'll never want to turn your computer off once you experience the ease of use, efficiency and enjoyment of the Treasure Chest of Software.

For the IBM PC: Captain & 1stMATE



- 0 to 384 KBytes of Memory on the Captain Board
- 0 to 256 KBytes of Memory on the 1stMATE Board
- Clock-Calendar with battery
- Serial Communications Port
- Parallel Printer Port
- Treasure Chest of Software

for the PC*jr*: the *jr*Captain



- 0 to 128 KBytes of Memory
- Upgrade to 512 KBytes with addition of *jr*Cadet Board
- Clock-Calendar with battery
- Parallel Printer Port
- Treasure Chest of Software

Tecmar, Inc. 6225 Cochran Road Solon (Cleveland), Ohio 44139-3377
Phone:(216)349-0600 Telex:466692

CIRCLE 501 ON READER SERVICE CARD

Graphics, Okidata 84/92/83, NEC 3550, C. Itoh Printmaster F10-55, Diablo 630 ECS, and Brother HR15/25. The software can also be used to configure *Jack2* for other printers.

In many ways, *Jack2*'s word processing is better than many dedicated word processors. It is easy to use, highly visual, and delightfully fast. Each envelope can store up to 9 pages of text, and each disk up to 90 pages.

Formal Integration

Jack2's other functions—database, spreadsheet, and graphics—may be incorporated onto the Form screen using the FIELD command. This involves positioning the cursor where you want to place a field, and then selecting the appropriate FIELD command to indicate an item in a database record, a cell in a spreadsheet, or a graph.

Each field has a name, selected by the user, and a type (Box, Variable, Row, Column, or Graph). The type will depend on whether you want a spreadsheet, database, or graph, so you never actually have to specify what function you'll be using. Take, for example, a personnel database containing the name, address, phone number, and salary of each employee in an organization. To create this database, you would begin by zooming into a blank form and typing the names of the data fields on the form. Then, you would insert Box fields to hold the form's data. Specifying the Box field type tells *Jack2* that this is a database file. This form would serve as a template for your data records. You can create records by filling out a form for each employee, similar to the one depicted in Figure 5.

> The spreadsheet, while sporting some convenient features, pales in comparison to the major integrated packages on the market.

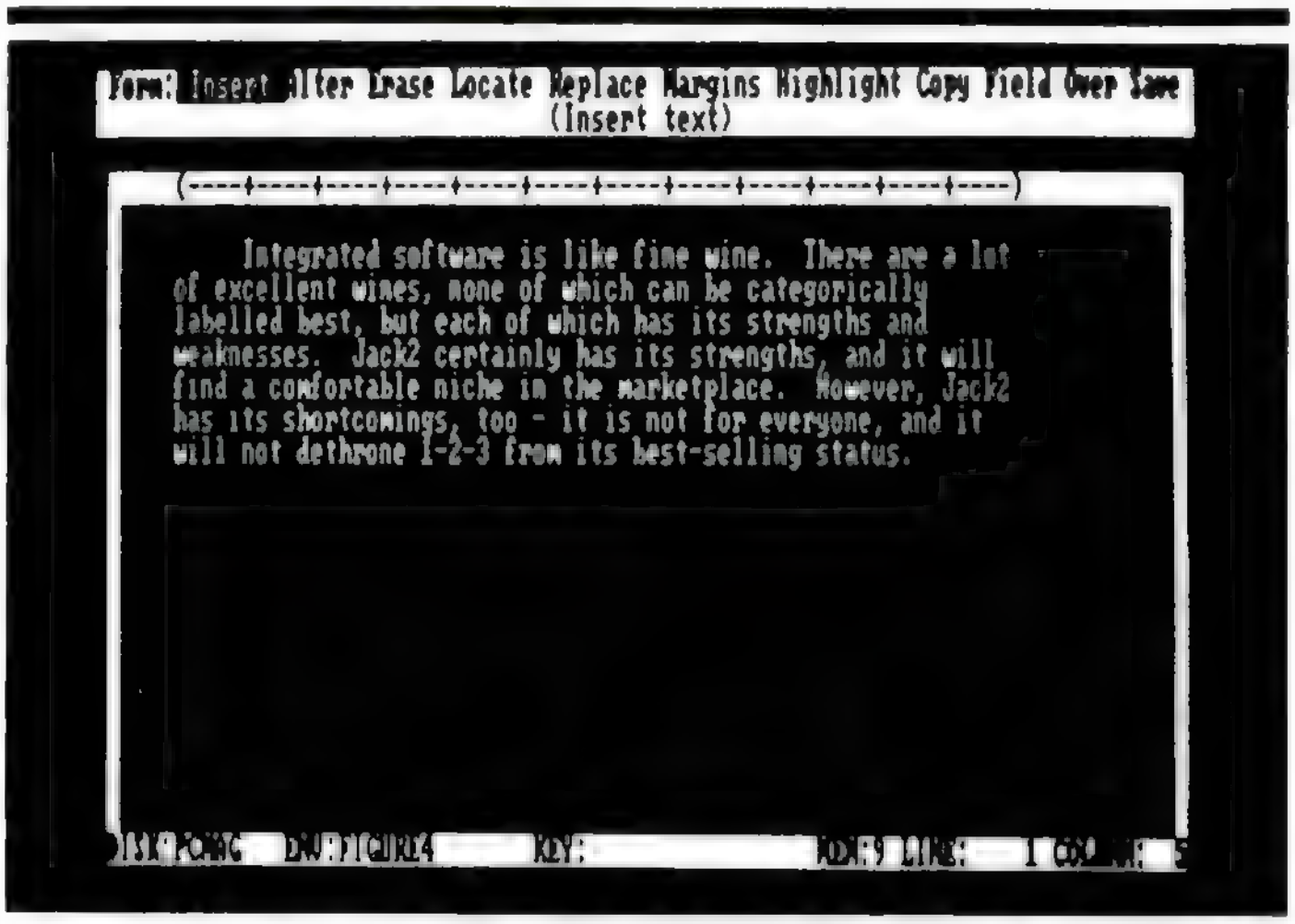


Figure 4: *Documents are entered on the Form screen, which can be used for word processing and other* Jack2 *functions.*

Once you have entered some records into the database, the Contents screen displays record icons in its icon lineup (see Figure 6), along with a form icon that represents the electronic form you used as a template for your data entry. There is also a blank record icon, indicated by an arrow. To fill out a form of data, you simply point the arrow to the blank record and use the ZOOM command. A blank form ready for data entry will appear on screen. Selecting a particular record for viewing or editing requires the same process: simply point to the record you want to see and invoke the ZOOM command.

Jack2 also allows you to select a subset of the database by specifying criteria with a command. For example, you can instruct *Jack2* to temporarily select the records of people whose salary is greater than $25,000, or people whose names begin with the letter *A*. You may then choose to have any further database commands apply exclusively to the selected group, or to the unselected group. Alternatively, you may select a data subset manually by pointing to the records you want to include in the subset.

You may sort a database on up to three field keys using a sort command. Thus, you could get a printout of the database sorted by salary and then further sorted within salary by name, and sorted again within name by some other field.

The integration between database and word processing is nicely orchestrated. You can create one envelope with a form containing a document, such as a form letter to be sent to employees. In this document you would embed a field for the employee's address, and after the word *Dear* in the salutation, insert a field for the employee's name. If you assign these items the same names as their corresponding fields in the personnel database, you can create personalized letters for each of the employees by copying the records of the personnel envelope to the form-letter envelope (using the Contents screen COPY command). You could even send a particular form letter to a specific category



Figure 5: *A template for personnel records containing vital employee information can be created with* Jack2 *and included in a database.*

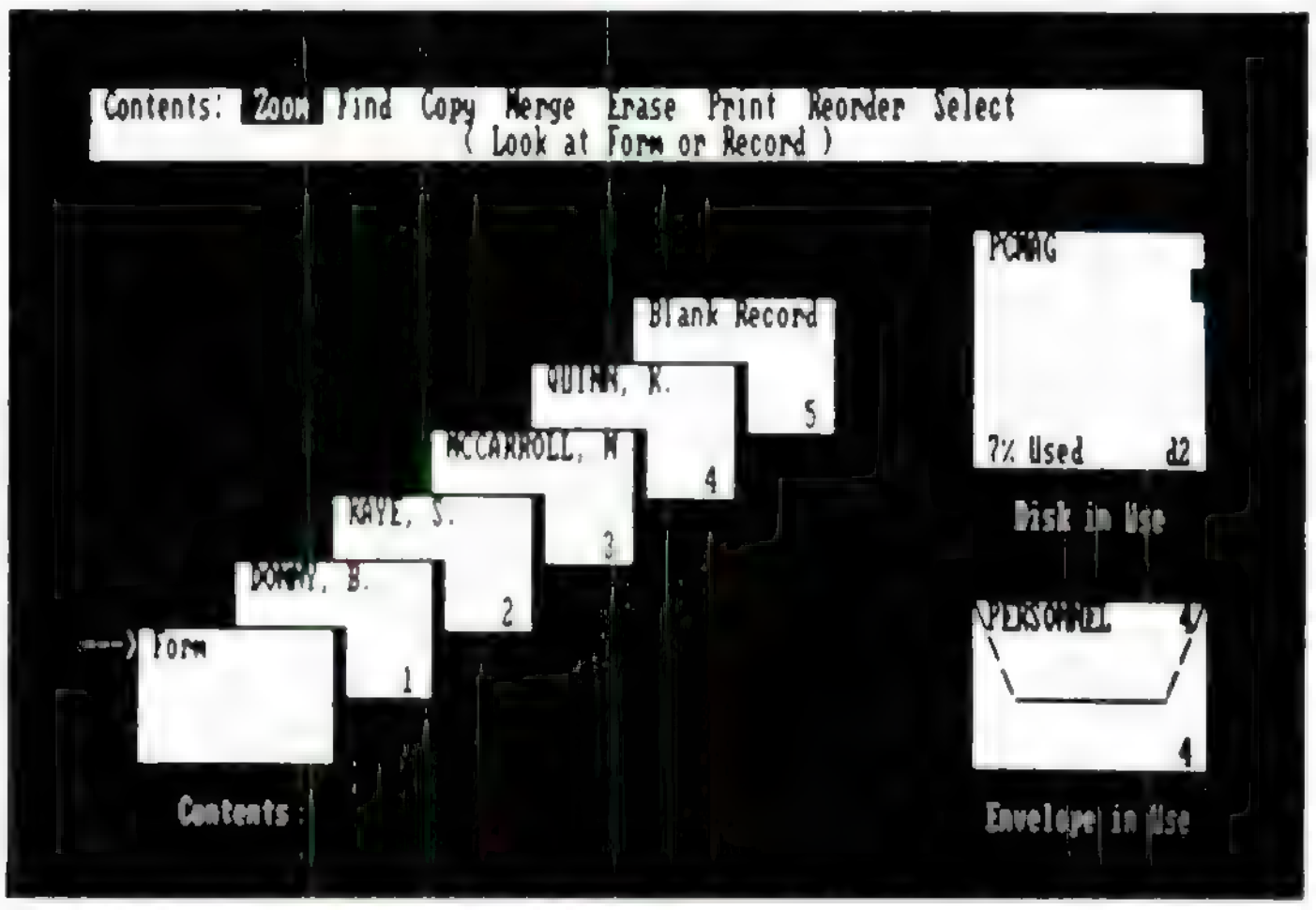


Figure 6: *Once the personnel records have been entered into the database, the Contents screen displays them in its icon lineup.*

of employees.

There are some important limitations to the database, however. You cannot derive subtotals or summaries of the database's contents. Consequently, you would not be able automatically to total the company's weekly salary expense using the personnel database. Moreover, there is very little flexibility in printing reports, unless you are willing to print the exact contents of records as they appear in the form. Business Solutions is marketing an additional product, *Jack2 Report,* to answer these needs, but at additional cost.

Spreadsheet Limitations

The spreadsheet, while sporting some convenient features, pales in comparison to the major integrated packages on the market. In some packages, the spreadsheet appears automatically—using it does not require an initial setup. In *Jack2*, you have to create the spreadsheet on the form by using the column and row field types. When specifying a column field, you must tell *Jack2* how many spaces wide the column should be and how many cells long. A row would need similar dimensional specifications.

If you wanted to develop a quarterly spreadsheet of a company's 12 categories of revenue, you would have to create either 4 separate column fields or 12 separate row fields. For each field, you would have to move the cursor to a position on the form and invoke the FIELD command to assign the field a name and type (column or row). Of course, if you will be using software primarily to do spreadsheets, you won't want to be bothered with this type of setup.

On the other hand, the ability to assign names to columns and rows is an advantage when creating formulas. Suppose you wanted to add a fifth column to add up the revenues for four quarters. If you had named each of the quarter columns (Quarter1, Quarter2, and so on) then a Full Year column could be computed automatically with a "calc rule": Quarter1+Quarter2+Quarter3+Quarter4. The entire Full Year column will be derived automatically with this formula.

In many spreadsheet packages, columns and rows cannot have names. Instead, their component cells have column-row addresses, such as A1 or J5. Storing a formula in an entire column in these packages is a two-step process: You have to enter the formula in the first cell of the column and then use a command to replicate the formula to the other cells of the column. *Jack2* circumvents the need for a replication command and a two-step formula assignment.

Jack2's spreadsheet capacity is limited.

TURN AN IBM PC DOT MATRIX PRINTER INTO A DAISY . . .



with *NicePrint*.

The standard of printing excellence is the daisy-wheel printer. The **NicePrint** software package improves your IBM, EPSON, or Gemini graphics printer to near daisy-wheel print quality. And possibly best of all, WordStar, 1-2-3 and most other programs will run just as before with the exception that your dot matrix printer now prints like a daisy!

Look at these actual print samples:

Here is a sample of dot matrix printing.
Change it into a daisy with NicePrint!

There are six font styles in this package:
Roman, Sans Serif,
ORATOR LARGE, Script style, OLDE ENGLISH and COMPUTER.
All font styles can be underlined, **boldfaced**, and *italicized* easily.

In addition, all fonts can have pica, elite, and four other pitches for maximum versatility.

NicePrint represents the ultimate in user friendliness because you only have to read one page of the manual to get it going!

For your convenience, **NicePrint** is not copy protected.

Contact your local IBM PC dealer for a demonstration. If he doesn't carry it, call or write us:

Spies Laboratories
(pronounced "speez")
P.O. Box 336
Lawndale, CA 90260
(213) 538-8166
Suggested retail price: $95.00

WordStar is a TM of MicroPro Corp.
1-2-3 is a TM of Lotus Development Corp.

CIRCLE 119 ON READER SERVICE CARD

JACK2

A spreadsheet cannot exceed 255 characters in width. Moreover, having more than 128K of memory in your computer will not provide you with more spreadsheet capacity. Since spreadsheet applications are memory-intensive, a user may well bump into the 128K barrier, especially if a large spreadsheet is being combined with a document on the same form.

Many of the capabilities of the more powerful spreadsheets are absent from *Jack2*. *Jack2* incorporates a few financial functions but no date arithmetic functions.

> Where Jack2 really fills the gap is in the areas of word processing, file management, and integration. It makes integrated software available to a deserving segment of the user population.

There is no cell protection and no facility for automating applications with command macros. You cannot fix title lines so that they do not disappear when the spreadsheet is scrolled, and there is no method for formatting values throughout the spreadsheet in a single step. To uniformly change the format or width of your entire spreadsheet, you would have to alter each field individually, in separate steps. If you want to transfer files between *Jack2* and other programs (such as DIF or ASCII files), you will have to purchase the companion package, *Jack2 Utility*. This is clearly not a spreadsheet for number crunchers.

Like the spreadsheet, the graphics function is not full-featured. The main strength of *Jack2* graphics is the program's ability to display graphs and text on the same screen. A graph can be created by moving the pointer to the spot where you want it to appear. Then you create a Graph type field and tell *Jack2* which field to chart and whether to plot a bar or line graph. The graph will appear in the specified place on the screen and in the document. An entire form—text, spreadsheet, charts, and all—can be combined in a single document and then reproduced on a printout.

However, outside of integration and simplicity, *Jack2*'s graphics are weak. *Jack2* does not take advantage of color and provides only two types of charts, line and bar. Moreover, the line graph is not really a line graph—it is a point graph. The plotted points are connected neither on screen nor in hardcopy. According to the manual, "This is done to prevent a loss of accuracy in the curve." Does your hand draw more accurately than your graphics printer? How many people invest in a graphics printer in order to draw line graphs by hand?

The software is limited in certain specific ways. It does not automatically supply a legend to identify what fields the bars or lines represent. Nor does it automatically label axes or center graph titles. Lack of pen plotter support makes this package unsatisfactory for presentation-quality graphics.

Despite these flaws, *Jack2* is, on the whole, a well-conceived, well-executed program. It will not suit everyone's needs, but then neither will the current leaders in the under-$500 integrated market. Number crunchers and power users may legitimately want a package with a better spreadsheet and more flexible (albeit complex) features.

Where *Jack2* really fills the gap is in the areas of word processing, file management, and integration. It speaks well for Business Solutions that the richness of integrated software is available to a deserving segment of the user population through *Jack2*. ■



You too can become an expert



with dBASE II training materials designed just for you.

You bought dBASE II to increase your productivity. But probably find yourself besieged with an up-front investment of time learning its full potential and training others. There is a solution – training materials designed by Adam B. Green, the dBASE II expert.

Since everyone has their own techniques for learning, Adam B. Green designed several tools, each with their own unique way of making you an expert on dBASE II.

For the beginner, the dBASE II User's Guide will get you up and running. It is considered the standard text on dBASE II with over 75,000 copies sold. For the advanced user, the Advanced dBASE II User's Guide will provide tips, techniques and practical programs which should save you from spending months "re-inventing the wheel."

To match your level of expertise, SoftwareBanc Seminars has been divided into three days of dBASE II training, including Fundamentals, Programming and Advanced Techniques. Classes are taught in a lecture format with the aid of a custom video projection and sound system. Live computer output is displayed, as well as prerecorded interviews with prominent software personalities.

And now, dBASE II Fundamentals is available on videotape, so you can reproduce Adam B. Green's popular seminar in your own home or office. This professionally-produced training package uses the latest video effects. Filmed in more than a dozen locations, it is an exciting and convenient way to learn dBASE II. A training version is also available, so you may train others with complete confidence.

Become an expert in dBASE II today, then train your staff to be experts, too.

SoftwareBanc
661 Massachusetts Avenue, Arlington, MA 02174
(800) 451-2502 • (617) 641-1235

dBASE II is a registered trademark of Ashton-Tate

CIRCLE 425 ON READER SERVICE CARD

The First Integrated Printer

Envision's VectorPrinter 430 offers the versatility of letter- and draft-quality text printing, color graphics, and plotting capabilities in one well-designed and well-built package.



Photograph Greg Sclight



Envision's VectorPrinter 430 is a big beige box with a microprocessor mind of its own—it may be the world's first piece of integrated hardware. It puts letter- and draft-quality text on paper along with color graphics and plotting capability.

Integrated software, where one package does everything so you don't have to memorize half a dozen manuals and hire a referee to make sure that your word processor gets along with your spreadsheet, is the latest computing rage. The hardware world, however, still seems lost in the age when every machine had a purpose, and every purpose had a separate machine.

But not the Envision VectorPrinter 430. If I might coin a term, the VectorPrinter promises to be an integrated printing system. The VectorPrinter is a worthy attempt to combine every possible means of putting ideas onto paper into one comprehensive (read: big and heavy) package. Covering the range from high-speed dot matrix to near letter quality, the VectorPrinter even tosses in multicolor graphics and the capability to emulate a multipen plotter for plying through charts, graphs, and transparencies. You could spend months exploring all the variations on the printing theme locked in its circuitry.

In truth, do-everything hardware is nothing new. You likely have a do-everything machine already: your computer. With the right software, your PC can handle almost any chore, as long as it remains in the Kantian realm of pure reason. By itself, the PC's mechanical abilities are—let's be nice—unextraordinary.

The VectorPrinter 430 can print anything in much the same way your PC can think anything—by being a computer. Inside the VectorPrinter a complete microcomputer shares dorm space with the printing mechanism. In fact, the VectorPrinter has more computing power than many personal computers. Controlling printhead, paper, and ribbon motions is an 8088 microprocessor just like the one lurking inside your PC. The printer also contains a full 128 kilobytes of RAM.

At its mechanical heart, the VectorPrinter is a robust, dot matrix, impact, plain-paper pecker. It differs from the common mien of dot matrix printers in its brutish size and its calligraphic artistry. Neither speed demon nor slowpoke, it's a Renaissance man among journeymen. You can use its diverse talents to create your own masterpieces.

The Machine

The package looks and feels impressive: big, square, a heavyweight. A central piano hinge allows lifting both the front and rear covers. A long row of membrane-switch pushbuttons lies along the front panel, partly covered by the front lid. These switches communicate your demands directly to the VectorPrinter's internal microprocessor, which also listens to and understands escape sequences and other control codes.

Also under the front half of the lid is the printhead chamber, which is made of spotless aluminum lined with foam to absorb sound. The VectorPrinter is thus among the quietest impact rattlers around (roughly 72 dB at 1 meter, approximately the loudness of a normal conversation). Robust motors and equally robust cogged belts drive both the long (to accommodate 15-inch paper) platen and the printhead.

The rear cover hides the bidirectional tractor. This means that paper can be routed through the machine without ever becoming visible; the printer could sit unrecognized on a tabletop.

The Rube Goldberg printhead itself is a clever but complex stack of four separate ribbons allowing instant color selection. A pallette of eight hues created from four ribbons is available. Each ribbon is in its own cartridge, so when you run out of one color, you need only replace one ribbon. The cartridges slide easily into place, and the machine automatically sorts through the stack upon your command.

Changes

This is not my first look at the VectorPrinter 430. I examined an earlier unit as one of "A Plentitude of Printers" (*PC*, Volume 2 Number 5). Partly in reaction to that critique, the VectorPrinter has been slightly modified. A few potential problems have been solved, and the VectorPrinter has been made even more PC compatible and probably even more useful.

After last year's review criticized the printhead temperature, Envision's engineers added a hefty heatsink to the mechanism. While the original VectorPrinter had the second-highest printhead temperatures measured in last year's test (it rose 39 degrees F in 5 minutes), after half an hour of continuous work, the new printhead measured a modest 12 degrees F increase. That's commendable because lower temperatures extend printhead life.

I also criticized the surfeit of tie-wraps requiring removal before a new VectorPrinter could be operated. Worse, some of the tie-wraps were supposed to remain in place to keep the proliferation of wires under control, while others had to be removed. Envision solved that problem with a modest redesign to eliminate the shipping tie-wraps.

Alas, the VectorPrinter still resembles a kit—you must mount the platen roller and the two rubber belts that drive it and the tractor. Don't worry, it's not much more than a 5-minute chore, and you're likely to need to do it only once. According to Envision, the platen roller is packed apart from the rest of the printer to keep it from getting bent during shipping.

You have your choice of where to plug the Envision 430 into your PC—both serial and parallel input ports are standard. The serial interface is a pleasure to use because there are no DIP switches to set.



VectorPrinter 430
Envision Technology, Inc.
631 River Oaks Pkwy.
San Jose, CA 95134
(408) 946-9755
List Price: $3,495

CIRCLE 799 ON READER SERVICE CARD

All your favorite parameters, including speed, word length, and parity, can be set using the front-panel membrane switches. Both a standard Centronic parallel connector (not IBM style, so you'll need an adapter cable to use it) and a DB-25 connector for the serial port are mounted on the rear of the printer.



An example of a full-eight-color, solid background, screen dump, printed on the VectorPrinter 430.

The Printer

The VectorPrinter 430's computing power will primarily be used for plain-vanilla printing, and in that regard it's a delightful, if not wonderful, performer. It falls into that vague class of dot matrix impact machines with aspirations of generating true letter quality text. And it comes close to doing just that. In last year's comparison of top-of-the-line printers, the VectorPrinter's print quality was rated the best.

Part of the explanation for the 430's sleek and chic typography is its ability to use mylar film-ribbon cartridges as well as inked-cloth ribbons. The precise, dark-black dots make each letter and number razor sharp in any of the machine's low-speed/high-quality modes. It's too bad that the ribbon cartridges do not match those of any of the more popular machines, which means that you may be locked into a single source of supply.

As in any matter of aesthetics, an evaluation of the look of VectorPrinter's standard typeface is entirely subjective. My personal taste rates the sharp, clear, but sans serif typefont as indifferent (see Figure 1). It looks fine, but I am reluctant to use it for manuscripts and business correspondence because it varies so widely from the typewriter-derived norm expected by editors and executives.

Perhaps so that finicky folks like me (and probably you) will not be completely dissatisfied, Envision allows you to make any of several other faces in the VectorPrinter's permanent memory the default face merely by pressing a button. Like all commands to set up the machine, the type font default can be set in EEPROM from the front panel and need not be reset whenever you turn the power off.

The type font selection is wide, indeed. Besides standard 10-pitch, there are 12- and 18-pitch versions of the default typeface (see Figure 2). The excellent clarity and readability of the 18-pitch characters justifies Envision's choice of the sans serif type font as a default. Two additional faces, Italics and Bold (see Figures 3 and 4), are fully serifed, and either would make a good choice as your primary font for letters and manuscripts. Slide in a black fabric ribbon and the Bold typeface looks exactly like a typewriter's work.

(continued)

"GET THE WIDEST RANGE OF IBM-COMPATIBLE COLOR GRAPHICS AND THE NEW SUPER



"Monochrome?" "Color graphics?"

Persyst PC/Color Graphics™ and PC/Monochrome™ display adapters. Same great performance and features as IBM. Available now.

Why wait around for delivery of an IBM monochrome or color graphics display adapter?

Persyst PC/Color Graphics™ and PC/Monochrome™ display adapters give you the same features, total compatibility and performance as IBM. Support IBM display monitors. Work with the IBM PC and XT, as well as Columbia, Corona and other IBM compatibles.

And they're in stock, *now.* At your Persyst dealer.

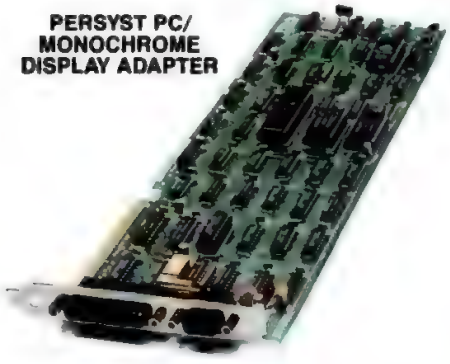
Persyst BoB™ super display adapter. Now you can get the best text resolution ever— in monochrome or color.

You've never seen anything like it.

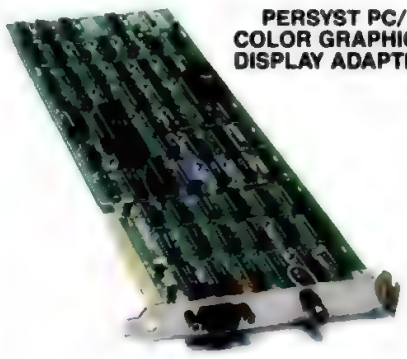
With a high resolution display,* the BoB super display adapter gives you the Best of Both—text and graphics—all on one board.

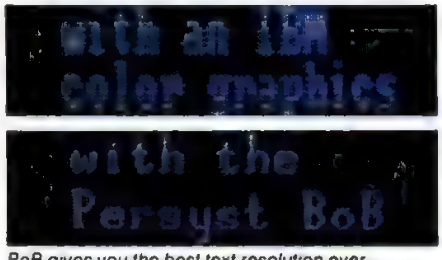
BoB delivers the clearest, sharpest alphanumeric text mode resolution ever—with a 10 x 16 character cell—in monochrome or color.

PERSYST PC/ MONOCHROME DISPLAY ADAPTER



PERSYST PC/ COLOR GRAPHICS DISPLAY ADAPTER





BoB gives you the best text resolution ever— even in color.

Brilliant graphics. BoB is unsurpassed.

Want crisp color graphics?

BoB supports IBM-compatible graphics packages like Lotus 1-2-3 with 640 x 200 resolution on both color and monochrome displays.

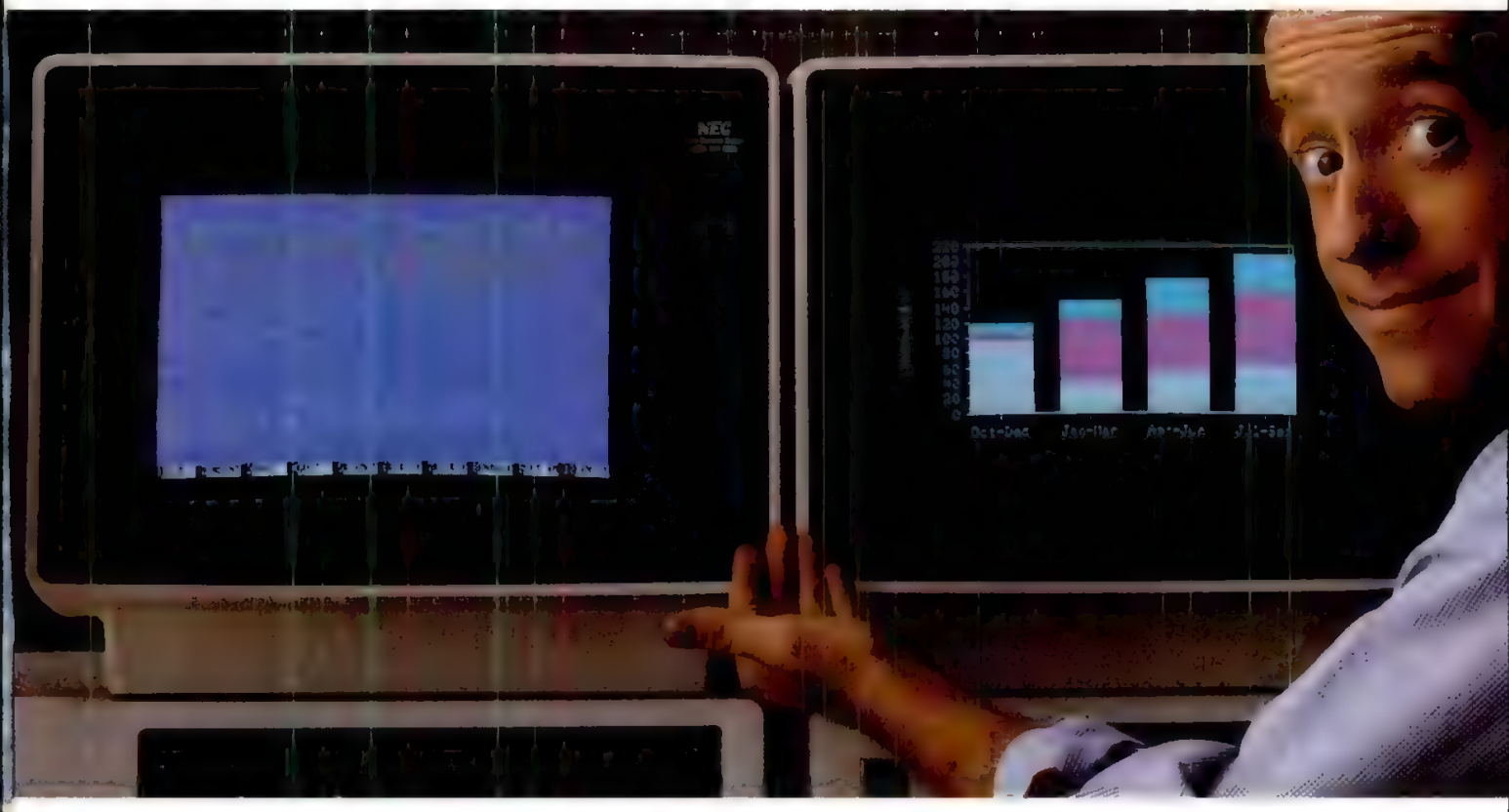
And optional 640 x 400 resolution is available for custom applications.

Custom programmable character sets. BoB gives you flexibility for special applications.

Revolutionary text resolution is just the start of BoB's unprecedented capability.

It is also the only display adapter that lets you use up to three character sets. Two in ROM, and one

DISPLAY ADAPTERS–MONOCHROME, DISPLAY ADAPTER–FROM ONE COMPANY?"



"The best resolution ever–plus color graphics and programmable character sets–all on one board?"

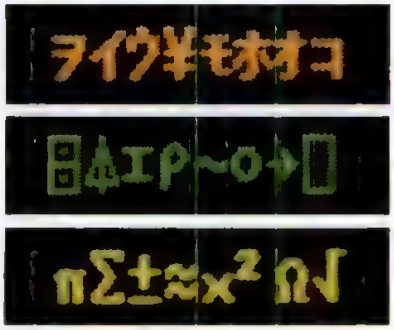
downloadable into static RAM.

Think of it.

With this unique option, you can design and download up to 256 custom characters. In any combination of language, scientific notation or graphics sets you want.

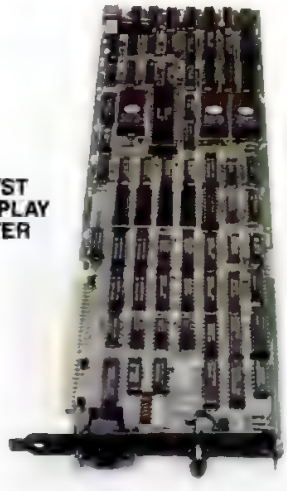
And you can change character sets as you change applications.

That's powerful flexibility you can only get with BoB.



Foreign languages. APL programming language. Scientific notation. With BoB, you can utilize any combination of character sets.

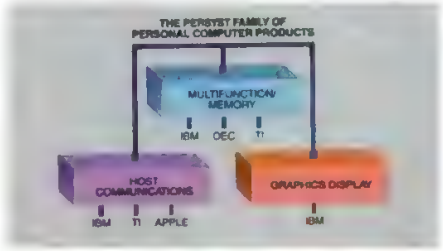
And only BoB lets you software select between three ROM/RAM character sets. So there's no more struggling with hardware when you want to switch.



PERSYST BoB DISPLAY ADAPTER

Display adapters for the IBM PC. Insist on Persyst.

PC/Monochrome and PC/Color Graphics for great basic performance. BoB for enhanced performance. Write or call today for the name of your nearest Persyst dealer or distributor.



PERSYST

Persyst Products, Personal Systems Technology, Inc., 17862 Fitch, Irvine, CA 92714.
Telephone: (714) 660-1010. Telex: 467864.

*NEC JC-1410P2(A), NEC JB-1410P2(A), and other NEC compatible monitors. IBM is a registered trademark of International Business Machines Corp. NEC is a registered trademark of Nippon Electric Corp. 1-2-3 and Lotus are trademarks of Lotus Development Corp.

"YOU CAN WITH PERSYST."

CIRCLE 512 ON READER SERVICE CARD

The 430's Orator typeface is more readable than most of that family, since the characters are wider than normal narrow Orator (see Figure 5). My favorite font, however, is Script (see Figure 6). Proportionally spaced, it looks much better than typewriter script does. It's readable, good-looking, and a step above the script faces most dot matrix machines make you pay extra for.

If none of Envision's typeface choices please you, any typeface you want can be downloaded into the VectorPrinter, including Japanese and probably even hieroglyphics.

The only disappointments in VectorPrinter's print quality are the high-speed, draft-quality type fonts (see Figure 7). The 18-wire printhead forms good character shapes, but the small wires leave too much white space around each dot, making the characters harder to read than most high-speed matrix output. Nor is the VectorPrinter a true high-speed performer; at best it isn't even twice as fast as the standard IBM Graphics Printer.

Beyond Plain Text

If high-quality printing is not enough, the VectorPrinter offers the additional benefit of understanding (and putting on paper) most of IBM's extended character set. You can do nongraphic screen dumps and expect all of IBM's block-graphic characters to print perfectly, just as if you had an official IBM printer.

I discovered that in bidirectional printing mode, continuous vertical lines in the IBM graphics set assumed a somewhat wavy texture from imperfect registration of alternating dot-rows. In cases demanding maximum print quality, however, the VectorPrinter can be set to print in one direction only.

Alas, the VectorPrinter's PC-compatibility is not complete. The command set IBM chose for its official printers doesn't quite match the one the rest of the paper-peckers in the world use, and Envision has opted for the overall industry standard rather than IBM's.

```
This is an example of the print quality of the Envision 430.
The font shown is called Standard 10.
This is an example of the print quality of the Envision 430.
The font shown is called Standard 10.
```

Figure 1: *A sample of the VectorPrinter 430's standard, default typeface.*

```
This is an example of the print quality of the Envision 430.
The font shown is called Standard 18.
This is an example of the print quality of the Envision 430.
The font shown is called Standard 18.
```

Figure 2: *A sample of the 18-pitch version of the VectorPrinter 430's standard typeface.*

```
This is an example of the print quality of the Envision 430.
The font shown is called Italics.
This is an example of the print quality of the Envision 430.
The font shown is called Italics.
```

Figure 3: *A sample of the VectorPrinter 430's italics typeface.*

You probably won't notice any problems in text modes, but load GRAPHICS.COM and try a screen dump by pressing the Shift and PrtSc keys, and you're likely to be quite surprised. Every time I tried it, the VectorPrinter developed a large appetite for paper and executed a seemingly endless string of form feeds. I don't know whether it was indeed endless because I switched the machine off (the only way I could reset it), to avoid spewing reams of virgin white sulfate surfaces directly into the dustbin. Luckily, this is not really a problem once you understand the VectorPrinter's graphic preferences—its software was designed to work specifically with the Plantronics color graphics board.

When I tried using the VectorPrinter for plain text with *WordStar*, I was warmed by generally favorable results. The VectorPrinter boasts a Diablo 630 emulation mode, which means that when you install your word processor as if you were using a Diablo 630, almost all of the program's printer commands will elicit their proper effects.

When I dashed out documents with the VectorPrinter masquerading as a Diablo, I ran into but one problem: The 430 buffers text in lines rather than characters, and it must receive a carriage-return command before it will type the line. Normally, every line *WordStar* sends to a printer does end with a carriage return, so for the bulk of a document there is no problem. The last thing that *WordStar* seems to send out the printer port, however, is a lonely formfeed command telling the printer to advance the paper up to the top of the next sheet. Apparently, no carriage return follows that final formfeed because the VectorPrinter invariably stopped abruptly after that last full line, and it would not formfeed to the top of the next sheet until it received a carriage-return command—usually after the first line of the next document was sent to it.

The pages are still properly separated, but the last thing you print may require you to poke the formfeed button to bring everything to a proper finale—disconcerting, but not a big problem.

Envision denied that the VectorPrinter had any problem with *WordStar* at all, suggesting that my use of a parallel port

might be causing the problem. Using a serial port, a different version of *WordStar*, and a different computer did not change the observed effect.

More frustrating is the plethora of VectorPrinter commands—multicolors and multifont—that you probably won't have access to through your word processor. (Of course, that's your software's fault, not the printer's.) You can send software commands through BASIC (or whatever), or you can change the most-used settings by massaging the membrane switches on the front panel. Just pull the VectorPrinter off-line, poke a few commands into its control panel, and resume your printing chore. Like other matrix printers, you can program the VectorPrinter to change nearly every printing parameter, including the most minute moves of the printhead. Variable line spacing and even proportionally spaced text are no problem.

Paper Shredder

Because the VectorPrinter uses a great big typewriter-like rubber platen, it easily handles both single sheets and continuous form paper. My first try at loading tractor-feed fanfold paper, however, met with disaster. The machine had a tendency to rip the paper into smaller shreds than I would normally want. Under my misdirection, the VectorPrinter unperfed the tractor-feed edges of dozens of pages between the first tractor and platen—even after I foresook my manhood and read the directions. My second try went easier, and after the third I could load paper quickly and almost painlessly. I needed only to master the unusual mechanism.

Perhaps the most bothersome aspect of paper loading is the absence of a platen knob to spin the first sheet of paper through the machine. The VectorPrinter requires you to advance the first sheet of paper through the threading path by grabbing hold of the platen drive belt and using it to roll the platen.

Although continuous-form paper can be fed into the VectorPrinter either from the rear or through the bottom, bottom-feed engages the tractor only as it is leaving the printer, turning the bidirectional tractor into a unidirectional mechanism. That transformation might become upsetting when you discover that the quickest way to print a picture is to dot an entire sheet in one color, change ribbons, back up the paper, and print it over again. The tractor mechanism can back up continuous paper only with the rear paper feed.

To ease the otherwise acrobatic chore of loading single sheets, the VectorPrinter offers a special single-sheet mode in which you need only lift the rear cover, slide the paper in place, and press a front panel button. The microprocessor takes over and rolls the paper to its proper printing position. Alas, the quicker color printing method is not possible for the full length of single sheets.

Although the VectorPrinter is not directly compatible with the PC dot-addressable graphics commands, all it takes is a little software to turn the proper tricks. Envision supplied me with a load-once-per-boot program that did the trick and brought graphic screen prints to life.

Plantronics Support

Because the VectorPrinter's capabilities go beyond standard PC fare, Envision has chosen to support the Plantronics graphics board rather than the standard IBM Color Graphics Adaptor. I discovered the Envision program works marvelously with the Plantronics and even provides some results with the IBM board.

My adventures with the IBM board were interesting, to say the least. The VectorPrinter tried hard to give me perfect graphic screen dumps—too hard. I played turtle with Logo and drew a rather elaborate figure on a black background and pressed the Shift/PrtSc key combination. The VectorPrinter rattled to life and pecked out a near-perfect replica of the

```
This is an example of the print quality of the Envision 430.
The font shown is called Bold.
This is an example of the print quality of the Envision 430.
The font shown is called Bold.
```

Figure 4: *A sample of the VectorPrinter 430's bold typeface.*

```
THIS IS AN EXAMPLE OF THE PRINT QUALITY OF THE ENVISION 430.
THE FONT SHOWN IS CALLED ORATOR.
THIS IS AN EXAMPLE OF THE PRINT QUALITY OF THE ENVISION 430.
THE FONT SHOWN IS CALLED ORATOR.
```

Figure 5: *A sample of the VectorPrinter 430's Orator typeface.*

```
This is an example of the print quality of the Envision 430.
The font shown is called Script.
This is an example of the print quality of the Envision 430.
The font shown is called Script.
```

Figure 6: *A sample of the VectorPrinter 430's script typeface.*

Figure 7: *A sample of the VectorPrinter 430's high-speed, draft-quality typeface.*

screen, white and magenta on black. But its little hammers covered every square inch of the paper with heavy black ink.

The demo software I received allows you to alter the VectorPrinter's interpretation of on-screen colors so that you don't have to churn through a complete black ribbon for a single screen dump. They also supplied a series of good-looking computer graphics which used the full Plantronics color pallette. Once the image was on the screen, Shift/PrtSc gave good on-paper copies of the video display. Color blending varied with the type of ribbons used. Film-ribbon inks, in general, are more opaque and blend less than the fabric-ribbon inks.

Graphic images with full backgrounds race through ribbons as fast as paper. After two black-background IBM screen dumps and three colorful Plantronics screen dumps, I ran out of black mylar. According to Envision, you can expect ribbons to survive 12 to 16 average screen dumps.

Printing a color image also consumes a good deal of time. Not only is the printhead speed slowed to allow denser packing of dots, but the head needs to traipse past each individual line up to four times. Thankfully, the VectorPrinter has enough smarts to run through its ribbons as efficiently as possible, retracing lines and shifting only when necessary.

As I mentioned, the color printing process can be accelerated by changing printing mode so that the entire sheet is printed in one color, the paper returned to its starting position, and the next color printed. Although the paper shifting process may result in some loss of true resolution, it actually seems to help colors blend. You can specify the location of any dot with precision to 1/360 inch horizontally and 1/144 inch vertically, but actual dot size is much larger.

Plotter Performance

Perhaps the biggest difference between the VectorPrinter and a plain dot matrix printer is its ability to understand HP-GL (Hewlett-Packard Graphics Language), an instruction set for computer plotters. Many HP-GL commands are for drawing vectors—sweeps of line in various directions and lengths. (A vector is a quantity with both direction and magnitude.) One command can draw a diagonal line simply by specifying its endpoints, a much more efficient way of sending graphic information than raster graphics, which specifies the characteristics of each dot.

> The VectorPrinter probably has more abilities than you can figure out how to use.

The VectorPrinter does not, however, draw lines as vectors. Rather, it absorbs a full page of vector commands and uses its microprocessor to sort a picture from them. Then it prints out the image dot-by-dot just like any other color dot matrix printer.

The big benefit is time—a page of vectors can be sent much faster than a page of dots. But the VectorPrinter has another advantage. Its large memory can serve as a buffer capable of holding roughly 6,000 vectors. To your programs and computer, the VectorPrinter looks like one devilishly fast plotter (taking almost *no* time to draw lines). Once the VectorPrinter's buffer is filled, it can keep the picture in memory and you can print as many copies as you want without tying up your computer.

Using the VectorPrinter can be a bit unnerving at first. Your computer pauses an amazingly short time for printing as the VectorPrinter fills up. Suddenly, your program says printing is done and you can do what you want—but the VectorPrinter just sits there.

You've just learned the vital difference between a true plotter and the VectorPrinter: A plotter draws as it goes along and, you know it's done because you can see the image. It needs no special command to tell it everything is over, it just stops. But without some signal that the end has come and gone, the VectorPrinter doesn't know that it has received a complete image.

Envision gives you two ways around this, a special "plot" command (which can be sent by software or entered through front-panel controls), and an internal timer that starts the VectorPrinter plotting after a sufficient delay with no additional commands flowing in from the computer.

The VectorPrinter works well with Lotus' *1-2-3* if you tell the program you're using a Hewlett-Packard 7470A plotter. You'll have to be creative to get the most out of the VectorPrinter, though, because the H-P limits you to two pens and the VectorPrinter has a full rainbow of colors.

Versatility

The VectorPrinter does not print as sharply as a daisy wheel printer, nor is it the fastest dot matrix printer you can find. It's not the only four-color machine on the market and it won't plot circles around a real plotter. Rather than improving on any single-purpose machine, it closely approaches the abilities of many different devices. Its value lies in its versatility.

Of course, the VectorPrinter may be more of a machine than you need at home—it probably has more abilities than you can figure out how to use. In fact, if you don't have a good deal of programming experience, you may find that there isn't a lot you can do with four-color, high-resolution dot-addressable graphics.

The VectorPrinter might prove a more worthy investment for business use. One place it will shine is anchoring a node in a network of PCs. The machine can handle most any chore it's given, its battleship-like construction assures it can take punishment and still run all day long, and its wide array of commands will bring tears of joy to your company's systems programmer. Like a lump of clay in the hands of a sculptor, in the hands of a systems programmer the VectorPrinter can be molded into nearly anything you want. ■

Micro Flash is Reliable

- In our 4th year of business *(One of the Originals!)*
- Positive buying power within the industry meaning well-stocked inventories and a consistent supply
- A reputation as specialists in the business and corporate marketplaces
- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
  We won't tell you to call the publisher or manufacturer for after-sale support.
  We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it – we'll replace it!

Micro Flash Terms

- MasterCard or VISA – with no credit card surcharge added
- Mail Orders accompanied by certified or cashier's checks
- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- $100.00 minimum order
- Products and prices subject to change without notice

Micro Flash Shipping

- $6.00 for UPS surface (except for printers and monitors)
- Add $3.00 per item for UPS 2nd Day Air
- All shipments fully insured at no extra charge
- Call for information on foreign orders, US Mail, CODs
- Overnight delivery service available

PRODUCTS FOR IBM PC & COMPATIBLES

HARDWARE & PERIPHERALS	RETAIL PRICE	MICRO FLASH
AST Research SixPakPlus 64K	$ 395.00	269.00
64K Ram Chip Sets "$1 per K"	100.00	64.00
CDC 9409 DS/DD Disk Drive	525.00	249.00
Davong 10 MB External	2395.00	1795.00
Hauppauge 8087 Chip	175.00	157.00
Hayes Smartmodem 1200	699.00	489.00
Hercules Graphics Card	499.00	369.00
Panasonic Half-Height Drives	495.00	189.00
Paradise Multidisplay Card	589.00	489.00
Printers – Epson, Oki, Diablo, NEC, Toshiba, Brother, Others		$CALL$
Princeton Graphics		
Max-12 Amber Monitor	249.00	189.00
HX-12 Hi-res RGB Monitor	695.00	524.00
SR-12 Super Hi-res RGB Monitor	799.00	629.00
Scan Doubler	249.00	214.00
PTI Datashield Power Supply	359.00	329.00
Quadram Expandable Quadboard	295.00	239.00
Diskettes – 3M, Dysan, Others		$CALL$
SOFTWARE		
Ashton-Tate dBase II*	$ 700.00	$379.00
FRAMEWORK	695.00	549.00
BPI Systems Accounting* (ea. mod.)	595.00	398.00
Continental Home Accountant Plus*	150.00	84.00
DayFlo (for IBM PC XT)	495.00	371.00
Fox and Geller QUICKCODE*	295.00	179.00
Human Edge Sales Edge	250.00	198.00
Microrim Inc. R:base 4000	495.00	349.00
Microsoft® Multiplan™*	195.00	148.00
Multi-Tool™ Word with Mouse	495.00	348.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	276.00
Business Basic Compiler	600.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	518.00
Sort Facility*	195.00	148.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstuf Crosstalk XVI	195.00	119.00
MultiMate Int'l MultiMate	495.00	298.00
Peter Norton Utilities	80.00	55.00
RoseSoft ProKey Vers 3.0	129.95	95.00
SPI Open Access	595.00	475.00

*Also available in Apple II Format

PRODUCTS FOR APPLE MACINTOSH

Davong MacDisk 10 MB	$2395.00	2059.00
Microsoft® Multiplan™	195.00	148.00
Basic Interpreter	150.00	122.00
Chart	125.00	98.00
Word	195.00	148.00
Maxell 3½" Diskettes	7.10	6.00

Member: Better Business Bureau, Chamber of Commerce
Listed: Dun & Bradstreet

Many other products available at comparable discounts! Quantity pricing available

For product information, price quotes, technical support and California orders, please call

415/680-1157

To order from outside California, call

800/458-2433

MICRO Flash™
COMPUTER SYSTEMS

1110 Burnett Avenue, Suites J & K
Concord, CA 94520

CIRCLE 315 ON READER SERVICE CARD

"Excuse Me,



Make Way For Hayes' Please.

An advanced, easy-to-use data management system for the IBM® PC and compatibles.

Want to get your paperwork out of a clumsy file cabinet and onto your PC's screen, where you can manage it better? Frustrated with data base software that's either too limited or too difficult to use? Hayes offers you a simple word of kindness.

Please.™ A powerful, yet easy-to-use, system for organizing and managing your information. *Please* is flexible enough to store any data you enter, and it'll return data to you in exactly the form you need. *Please* does more. It does it all faster. And it's sure to please!

"The menu, Please?"

Menus list all your options and tell you exactly which keys to press for every *Please* feature.

That's to be expected. As the telecomputing leader, Hayes built its reputation on quality design, reliability and customer support. Now these same standards have been applied to a new data management system that is going to instantly change the way you do business!

Say you're looking for an efficient way to maintain sales data. *Please* leads you every step of the way in creating a sales database that might include names, addresses, dates and figures. These categories are called "fields" in database lingo, and they're the very heart of your database structure.

"Make it snappy, Please!"

Need a report fast? You and *Please* can put together a Quick List in a matter of seconds.

Want last month's total in a particular region? Press a few keys and it's yours! A few more keystrokes and you'll know who's moving product, and what's your biggest seller.

Please will supply you with labels for a mailing to selected customers. It can send customer information to your word processor for a promotional letter. And it can receive data from your spreadsheet program. *Please* will even look up a name and company for you, your Hayes Smartmodem* will dial the phone number, and you're ready to talk!

Taking this same sales database, you might also want to define special fields for a custom Output Plan. With a defined field for "COMMISSIONS DUE," *Please* can automatically compute each salesman's commissions, and print them out in a report of your own design. All this and more, just for saying "Please."

And if you ever change your mind and want to change the structure of your database, please feel free. Step-by-step instructions show you how.

You have the same flexibility with any database you and *Please* design. You can store up to 16 million records and 200 custom Output Plans for each database! More than you're likely ever to require. But isn't it nice

Please is a trademark of Hayes Microcomputer Products, Inc. * Smartmodem 300, Smartmodem 1200 and Smartmodem 1200B are trademarks of Hayes Microcomputer Products, Inc.

Please"



"Put it here, Please."
Design a special screen format to position data in a particular place.

knowing all that storage power is there? Just in case you ever need it?

Now you might think that a data management system that does all this must be difficult to use. Right? Rest assured. *Please* works hard so you don't have to. An easy-to-follow sample disk shows you everything you need to know to create your first database. Three *Please* menus show you which keys to press to access every feature. And whenever you need it, *Please* provides on-screen HELP messages, tailored to a specific task. So you needn't waste time reading through a list of unrelated instructions on your screen. Or stop what you're doing to consult a manual. In no time at all, and with no assistance at all, you'll be a *Please* database pro!

"Merge these, Please!"
Combine data from one database into another, without changing your original.

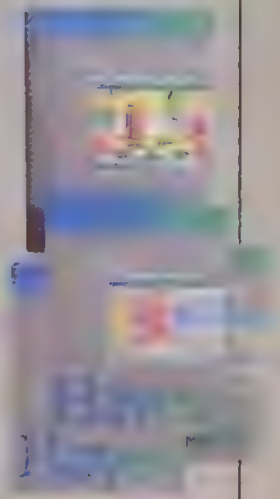
Everything about *Please* is designed to save you time and effort. So what could make data management even easier? *Please Application Templates*, that's what!

To help you get up-and-running immediately, we've developed a series of practical, pre-designed templates. You'll appreciate their well-thought-out structure, and "fill-in-the-blank" ease. Choose several! For business and personal use. Including *Mailing List*, for storing names and addresses and producing mailing lists. *Contacts*, for managing facts and figures about your sales contacts. *Applicants*, for following applicants throughout the interviewing process. *Appointments*, for maintaining your calendar and tracking all of your business expenses. *Household Records*, a complete home management system. And more! Your dealer has details!

Buy *Please* now! Get a FREE *Mailing List* template from your dealer.

Second FREE template of your choice, direct from Hayes!

Help yourself. Please! And take advantage of these two valuable offers. See your dealer right away!



Hayes™

Hayes Microcomputer Products, Inc.,
5923 Peachtree Industrial Blvd.,
Norcross, Georgia 30092. 404/441-1617.

CIRCLE 303 ON READER SERVICE CARD

IBM is a registered trademark of International Business Machines Corporation. ©1984 Hayes Microcomputer Products, Inc.

HARD DISK + With A Single Slot.

Unleash your IBM-PC/XT with IDT's hard disks and SCSI technology.

Innovative Data Technology is bringing unprecedented power and virtually unlimited expansion to IBM-PC/XT users. Our new SCSI (Small Computer Systems Interface) hard disk subsystems put massive storage capacity at your fingertips—from 11 to 126 MB in a single external drive. With the capacity of configuring up to 14 drives through the SCSI bus, that puts nearly two billion bytes of on-line storage at your disposal.

Single slot expansion

Unlike most PC add-ons, IDT's SCSI hard disk subsystems and other peripherals are connected through a single SCSI host adapter on your PC—no additional expansion slots or cards are necessary—future disks and other peripherals and additional PC hosts are simply daisy-chained into the SCSI bus.

Multi-user capability

IDT built the SCSI hard disk subsystem with multiple users in mind. One, two, or more IBM-PCs can access disk drives and other peripherals through the SCSI bus, allowing you to build a sophisticated system tailored exactly to your requirements.

The options are yours

With IDT's SCSI host adapter board, future expansion becomes a snap. Additional peripherals, including an extensive line of 1/2-inch IBM-compatible magnetic tape transports, are available for immediate shipment from IDT. You simply don't have to wait or worry about equipment compatibility with IDT components. Watch for 1984 announcements of streaming cartridge drives, printers, etc.

Tomorrow's solution today

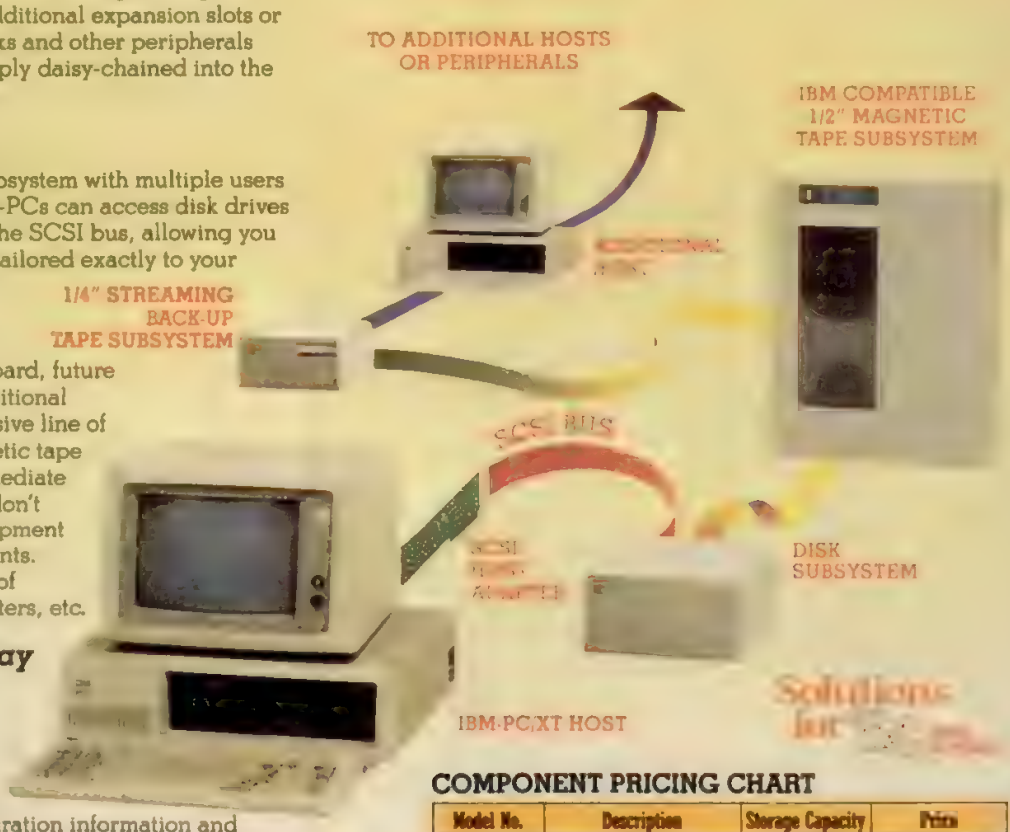
IDT's SCSI host adapter and SCSI hard disk subsystems will answer your data storage and system design requirements today. Contact IDT for complete system configuration information and details on other products.

Successful and easy installation assured

Supplied with each component are the required cables, complete software driver package and user language instructions. The user manual will have you quickly running and appreciating the many features of the subsystems, such as quick automatic boot load of the operating system from the IDT disk subsystem.

Satisfaction guaranteed!

If not satisfied, the subsystems may be returned on approval from IDT within a 10-day period. All subsystems and components carry a six-month return-to-factory warranty on parts and labor.



COMPONENT PRICING CHART

Model No.	Description	Storage Capacity	Price
RD 2011M	Master Disk Subsystem	11MB	$2000.00
RD 2023M	Master Disk Subsystem	23MB	2550.00
RD 2035M	Master Disk Subsystem	35MB	2950.00
RD 2047M	Master Disk Subsystem	47MB	3150.00
RD 2126M	Master Disk Subsystem	126MB	6840.00
RD 2011S	Slave Disk Drive	11MB	1560.00
RD 2023S	Slave Disk Drive	23MB	2130.00
RD 2035S	Slave Disk Drive	35MB	2530.00
RD 2047S	Slave Disk Drive	47MB	2730.00
RD 2126S	Slave Disk Drive	126MB	6290.00
RD 8111H A	IBM-PC/XT Host Adaptor		510.00
IDT 1/2" Magnetic Tape Subsystems			Consult Factory
IDT 1/4" Streaming Back-up Tape Subsystems			Consult Factory

Ordering Example: If your need is a 23MB Subsystem, your order would consist of the following components: **1-RD 2023M** @ $2550.00 + **1-RD 8111H/A** @ $510.00 + **Shipping & Handling** @ $12.00 = A **Total Order** of $3072.00 + tax (if applicable)

How to order:

Using the chart to your right, you may order IDT hard disk subsystems and SCSI host adapters by calling:

1-800-522-1500 Ext. 717

FOR IMMEDIATE ORDERS ONLY

Prices and availability subject to change without notice. No CODs. Send cashier's check or money order. All other checks will delay shipping three weeks. MasterCard and Visa accepted (include telephone number). Add $12.00 for handling and shipping UPS ground within the continental U.S. California residents add 6%. Approval needed on all returns. 0–10% restocking charge on all returned merchandise

For additional product or technical information please call or write:

INNOVATIVE DATA TECHNOLOGY

ON THE RIGHT TRACK

P.O. Box 178160 • 4060 Morena Blvd. • San Diego, CA 92117
(619) 270-3990 • TWX: (910) 335-1610

CIRCLE 110 ON READER SERVICE CARD

IBM is a trademark of International Business Machines Corp

Stitching Creative Designs By Pixel

Struck by the resemblance between a computer screen and a needlepoint canvas, two authors used a PC to design patterns that can be stitched pixel by pixel.

Computer graphics is a rapidly expanding field. Artists are using personal computers combined with both software and input devices to create drawings on screen. Now, these applications are spreading to other areas of creative design, including crafts such as needlepoint. We happened to notice the resemblance between a needlepoint canvas and a computer screen and set out to use an IBM PC and graphics software to design patterns that could be transferred onto a piece of canvas. We called our project computer-aided needlepoint (or CAN).



Figure 1: *The resemblance of the computer screen to a needlepoint canvas is apparent in this photograph of the computer screen, which shows a detail from a larger design in the* Kaleida *program.*

Needlepoint is a form of needlework in which you use a needle and thread to stitch designs in a coarse, open-weave canvas. Each stitch can be seen as the equivalent of

a single pixel on the screen. This is clearly illustrated by the design in Figure 1, which was generated using the graphics program *Kaleida* (which is available from Once Begun Computations, in Searsport, Maine). Our task was to see whether we translate one medium into the other—

As the brightly colored circles took shape on the canvas, the problem of aspect ratio became obvious.

stitch for pixel, and vice versa.

Problems became immediately apparent as we tried to count pixels. Counting vertically down the *y* axis was easy, but counting across the *x* axis was difficult because the pixels all run together. However, with the help of *Glyphix*, a drawing program with on-screen feedback of pixel location, we counted the horizontal pixels and translated this simple design to canvas. (*Glyphix* is available from Starside Engineering, in Rochester, New York.)

As the brightly colored circles took shape on the canvas, the problem of aspect ratio became obvious. Unfortunately the "canvas" of the computer screen does not have square holes. The computer "holes" are standing rectangles with a size ratio of approximately three on the horizontal axis to four on the vertical. The computer compensates for this to some extent when graphics shapes are put on screen. For example, if you ask for a circle with a radius of 20 pixels, the computer generates a (nearly) round circle on screen. But when you count the pixels displayed, you'll find that the horizontal diameter is 40, just as you ordered, but on the vertical *y* axis you'll count only 34. Translating screen circles to needlepoint canvas produces not circles, but short ellipses that are oriented horizontally. Despite this problem, we proceeded using a straight pixel-to-stitch translation of the on-screen pattern. The result was a bright, simple pattern that was slightly different than the on-screen original.



Transferring Designs from Screens to Canvas

Figure 2 is the needlepoint pattern of the fancy lion that caused us to begin thinking about the resemblance between pixels and stitches. Figure 3 depicts the simple plotting of a projected slide. This was the first method that we used to go from one medium to the other. Figure 4 shows the fancy lion on screen. Notice the difference in aspect ratios between screen and needlepoint. In Figure 5 *Kaleida Designs* shows the gentle elongation that will result in the correction of the aspect ratio when translated into needlepoint or any similar decorative art. *Kaleida Designs* comes to life in Figure 6 as the needlepoint takes form showing the same pattern shown in Figure 5.

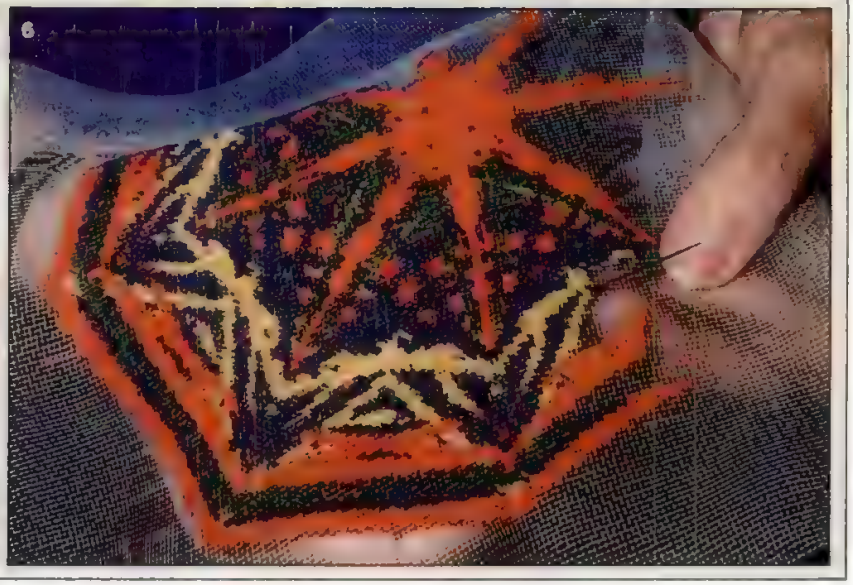
At the same time, we took a complicated needlepoint pattern, a drawing of a lion (see Figure 2 above), and attempted to translate it to the computer screen. We didn't attempt to draw the geometric border directly on the screen. Instead we programmed it in BASIC, which was ideal because of the repeating pattern. The central portion was far more difficult, however, and trying to use the DRAW command in BASIC didn't work, because the design was too complicated; 15,625 pixels (125 × 125) had to be drawn in.

Again *Glyphix* came to the rescue. Before the drawing program could be used, however, the design had to be plotted in such a way that translation would be possible. Special graph paper made for this purpose is sold in stores handling nee-









dlepoint supplies. We used a simple solution to get the design onto the graph paper. We projected a slide of the completed needlepoint onto the graph paper using a carousel projector (see Figure 3 above) and traced the outlines of the pattern. Then, using *Glyphix*, the line patterns were taken from graph paper coordinates and plotted on the computer screen (see Figure 4 above). As expected, the difference in the aspect ratios from screen to canvas is present but not obtrusive.

Thus, this translation of the fancy lion from needlepoint to computer used photographic-assisted transfer from one medium to the other via a graphed intermediate stage. But this method is time consuming, and the computer offers no assistance.

Several possible solutions to the problem of the aspect-ratio difference between the computer screen and the needlepoint canvas exist. You can accept the distortion, as we did with our circles (and with the lion on the computer screen) or ignore the actual numbers of horizontal pixels and use direct measurements of horizontal distances from a printout or photograph. This solution is circuitous; we intended to translate either medium to the other on a one-to-one, pixel-to-stitch basis. A final solution would be to correct for the aspect ratio discrepancy when screen graphics are created. This solution is the best one, because it allows the computer to provide the most assistance.

(continued)

Knowledge Manager: The software that keeps on growing...



Whether your needs are simple...

Features*	Advantages*	Benefits*
Unlimited number of tables open at a given time	No need to open and close tables repeatedly	Speedier answers to your queries
Up to 255 fields per record	Greater descriptive capacity	Lowers frustration of having to deal with multiple tables for a single topic
Passwords, read/write access, data encryption	Access to data is individualized	Unauthorized use of data prevented
Query multiple tables with a single command	Retrieves data without unnecessary intermediate steps	Users get information more efficiently
Query syntax like IBM's SQL/DS	English-like commands	Users not required to learn a new language
Dynamic sorting and grouping of query output	Control of output format	Data can be customized to users needs
Spreadsheet cells may be defined in terms of • formulas • data table values • programs	Cell can automatically retrieve information from tables and can perform intricate mathematical operations on that information	No need to rekey information or perform calculations separately
Forms creation for screen and printer using 8 colors, blinking, bell, prompts, reverse video, etc.	Greater versatility in screen and printed output	Screens and forms are easy to understand and use
Statistics (e.g., min, max, average, sum, standard deviation, variance, etc.) automatically generated	Provides more complete analytical description of data	Improved decision-making capabilities
High resolution color graphics: pie charts, bar charts, area curves, scatter diagrams, etc.	Numerical data from spreadsheets and tables can be pictorialized	Patterns and trends easier to spot

*Partial List

We help a lot of different people solve a lot of different problems: from the simplest to the most complex...from mailing lists to integrated accounting, from preparing tax returns to order entry. Whether you need help saving money or making it, the Knowledge Manager can help you manage your information better than any other micro software package.

Quality Software for Quality Results

You can start just as simply as you want and grow just as fast as you like. The Knowledge Manager's powerful commands are always ready when you are. You get quick results, improved productivity, accurate information, custom tailored to meet your needs. The Knowledge Manager lets you use your information, when you want it and in the way you want it.



intricate. . . or somewhere in between

Reliable and Comprehensive

The Knowledge Manager is built to last. You can start with the Beginner's Guide, or run right through the instruction manual to advanced data management commands.

Chances are you won't find a job the Knowledge Manager can't do.

Dealer inquiries invited.

KNOWLEDGE man™

KnowledgeMan is a trademark of Micro Data Base Systems, Inc.; SQL/DS of IBM.

Please send me:
- ☐ Free feature-by-feature comparison
- ☐ Forms painter and graphics information and pricing*
- ☐ Run-time package information and pricing*

*Forms painter, graphics and run-time package are available as optional components.

- ☐ Please accept my order for KnowledgeMan Package $500.00
- ☐ Shipping and Handling† 10.00 (Indiana residents must add 5% sales tax—$25.00)

Machine: _____

Operating Systems:
☐ PCDOS ☐ MSDOS ☐ CP/M-86

Disk Format:
☐ 8" IBM-3740 SS/SD
☐ 5¼" IBM PC SS
☐ 5¼" Victor/Sirius
☐ 5¼" DEC Rainbow

†Add $20.00 if outside U.S., Canada or Mexico

☐ Check or money order enclosed (must be drawn from U.S. bank in U.S. currency)

MasterCard No. _____
VISA No. _____
American Express No. _____
Expiration Date _____
Bank No. (if M.C.) _____
Signature _____

VISA, MasterCard and American Express orders may be placed by phone (317) 463-2581.

Name _____
Title _____
Company _____
Phone (___) _____
Address _____
City _____
State _____ Zip _____

Send To:

MDBS/Consumer Products
P.O. Box 248
Lafayette, IN 47902
Phone: (317) 463-2581
Telex: 209147 ISE UR

Or Contact Your Local Dealer.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
Current release is 1.06 as of 4/1/84.

REBQ206

CIRCLE 525 ON READER SERVICE CARD

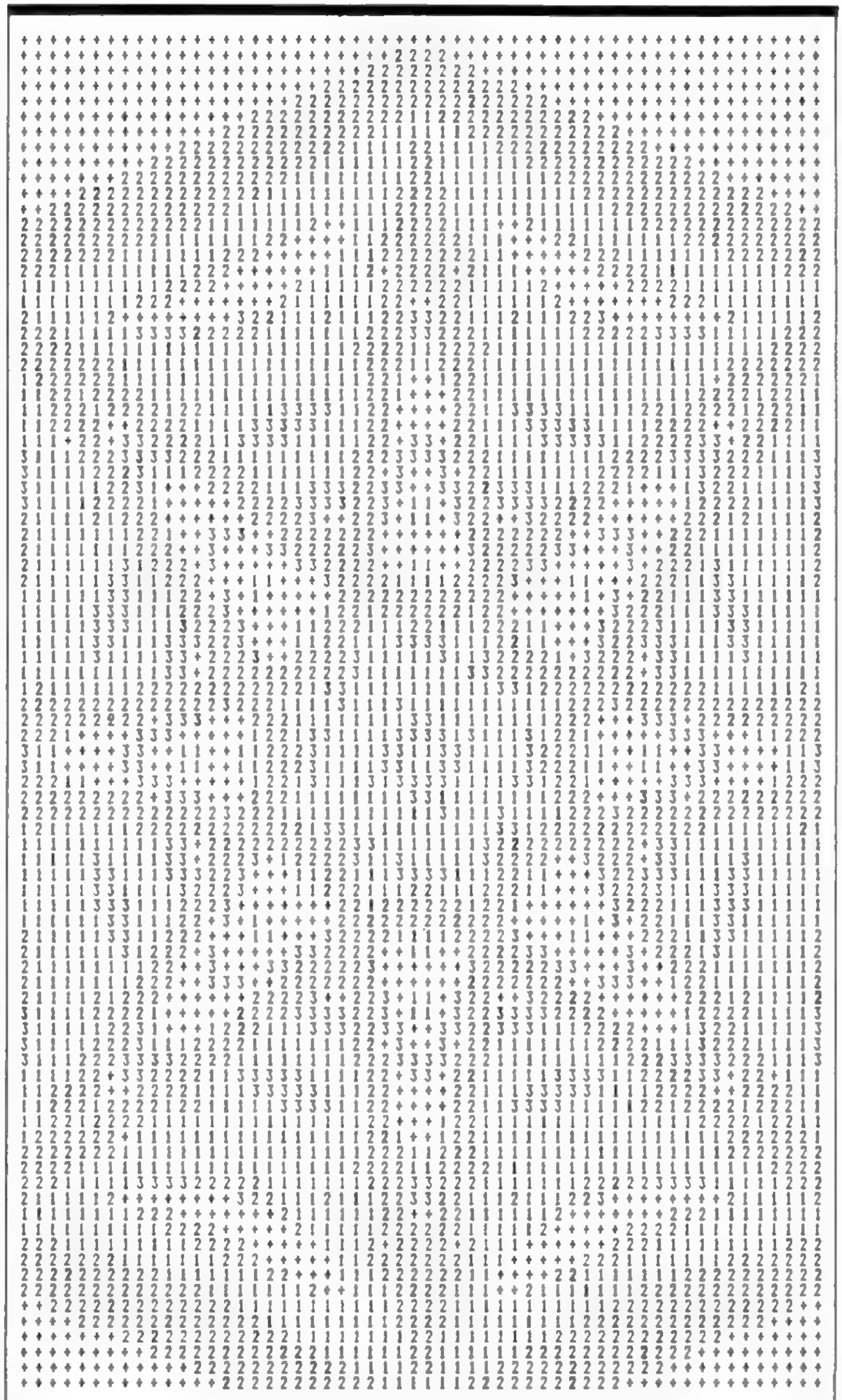
We still didn't have a solution, but help turned up in the form of M. Gary Cohen, *Kaleida*'s author and proprietor of the software firm Once Begun Computations.

We had written Cohen to tell him of our project to convert one of *Kaleida*'s designs to needlepoint and about our problems with aspect ratio and of plotting our designs onto graph paper.

Kaleida Designs' patterns can be manipulated and can be frozen at various degrees of complexity.

Cohen responded that he could correct *Kaleida*'s aspect by elongating it in the vertical dimension and then provide a program that would print out the design, pixel by pixel. Each pixel would be represented by a number, which corresponded to one in IBM's color graphics palette! His new version, which will be called *Kaleida Designs*, would produce correctly proportioned, printed patterns.

When the *Kaleida Designs* prototype program arrived, we booted it up, and there was our friend *Kaleida*, in a form that would correct the aspect ratio when its printout was used for a needlepoint pattern (see Figure 5). We let the program run and then hit the "freeze action" key when the right design flashed on screen. After turning on the Epson printer, we pushed D (for dump), and for the next 19 minutes the screen pattern printed out in three strips, which, when pieced together side by side, included every pixel. Each pixel was marked either with a + for background color, or a 1, 2, or 3 for the appropriate color in the IBM graphics palette. When taped together, the entire design was displayed in one large pattern (the central portion of a *Kaleida Designs* printout accompanying this article)—the ultimate



The central portion of a printout from the *Kaleida Designs* program. Each pixel is labeled according to its color in the IBM PC medium resolution graphics palette. Background pixels are indicated by a plus (+) sign.

"paint-by-numbers" design!

At this point we ran into the final but inevitable bottleneck: reproducing in stitches the extremely complex screen design, which, even when squared off to include only the *Kaleida Designs*' pattern and a surrounding border, contains approximately 40,000 discrete points. We were ready to give it a try and obtained the appropriate silk yarns, matching IBM's medium-resolution palette 0. We chose a blue background, and slowly the intricate pattern, which is shown in Figure 6, took form. (Bear in mind that *Kaleida Designs*' patterns can be manipulated to some extent and can be frozen at various degrees of complexity.)

By the time this article appears, the design should be complete. Sewn with silk thread on a fine canvas and of tapestry quality, it will measure 8×8 inches. Thanks to Gary Cohen, our canvas truly represents computer-assisted needlepoint.

We have now come full circle. With the soon-to-be-released *Kaleida Designs* the user will be able to specify the shape, size, proportions, and colors of the computer-generated design and thus produce a myriad of patterns suitable for decorative arts and crafts. In addition, patterns can be frozen on screen or saved on disk to be compared with other designs; designs can be formed and manipulated with keyboard commands. And, finally, shapes can be printed out either as finished graphics or as graphs with colors plotted by number (as described above for the prototype program we used for the needlepoint). These designs are applicable to almost any decorative medium—tilework, rugs, needlework, or whatever you can think up.

The future promises numeric screen dumps for design purposes. With these, any on-screen graphic pattern can be printed out "by numbers" for translation to needlepoint or any other medium. Is there such a program? Not yet, but Cohen's working on it, and the utility—tentatively named *Pixel-ID*—is on the way. Now, if we can only figure out some way to get the PC to do the stitching. ■

IBM PC & XT

IBM PC & XT Computers Call

SOFTWARE FOR IBM PC

dBASE II	$359
Lotus 1-2-3	$CALL
Home Accountant Plus	$99
Peach Pak Series 4 (A/R A/P G/L)	$239
Peach Text 5000	$237
PFS: File	$89
PFS: Report	$79
PFS: Graph	$95
PFS: Write	$89
SuperCalc II	$165
SuperCalc III	$259
TK! Solver	$219
Versaform	$249
Wordstar Professional	$365
Word with Mouse	$299
Microsoft Word with Mouse	$285
Hayes Smartcom II	$79
Multiplan	$155

COMPAQ

Compaq ... $CALL
Compaq ... $CALL
CompaqPlus 128K ... 10MB ... $CALL
CompaqPlus 256K ... 10MB ... $CALL

COLUMBIA COMPUTERS

Model 1600 1 ... Call
Model 1600 4 ... 2M ... Call
Model 1640 VP ... Call

SANYO

DESK TOP BUSINESS COMPUTERS

MBC 550, 128K 1 drive ... CALL
MBC 555, 128K 2 drives ... CALL
Sanyo green monitor ... $179

KAYPRO

CALL FOR PRICE!

MONITOR SALE

★★★★ RGB COLOR ★★★★

Princeton HX 12 ... $469
Amdek RGB Color II Plus ... $459

★★★ GREEN SCREEN ★★★

ELKA ... 20 Mhz ... $119
Dynax GM 120 ... 20 Mhz ... $129
Instant Dis. MR 12/G ... $Call
USI PI 2 ... 20 Mhz ... $129
Taxan KG-12N ... $149

★★★ AMBER SCREEN ★★★

Dynax AM 1 ... 20MHz ... $139
Taxan KA12N ... $125
USI PI 3 ... 20MHz ... $145
Amdek 310A ... $165
Princeton MAX 12 ... $199

AST

Multi-Function Cards for IBM PC and XT

(Each card now comes w/ SuperDrive & SuperSpool)

SixPakPlus Cards

Memory installed on card	none	64K	128K	192K	256K	320K	384K
with parallel, serial ports & clock	$227	$267	$317	$367	$417	$467	$517
above plus game port	$262	$302	$352	$402	$452	$502	$552

MegaPlus II Cards

Amount of memory installed on board	None	64K	128K	192K	256K
w/ serial port No. 1 & clock	$226	$266	$316	$366	$416
w/ either parallel or serial port No. 2	$274	$314	$364	$414	$464
w/ both parallel & serial port No. 2	$309	$349	$399	$449	$499

MegaPak ... expands a fully populated MegaPlus card (256K) to 512K ... $299
Optional Game Port ... add $50

I/O Plus II Cards

Standard card w/ one serial port (S1, and clock calendar ... $129
Additional Parallel (P), Game (G) or Serial 2 (S2) port ... add $35 ea

QUADRAM

QUADMASTER II ... 9 function memory expansion card for IBM PC

- Up to 384K
- Game port
- Chronograph
- Parallel port
- Serial port
- Quadram's built-in QUADHAM drive
- Master reset
- Bracket

Amount of memory installed	0K	64K	128K	192K	256K	320K	384K
w/ parallel, serial, game, clock	$235	$275	$325	$375	$425	$475	$535

TASC MASTER

Add Math Tasking to your IBM-PC and XT now!

AddRam Elite or AddRam Plus Ultimate Multi-Function Boards

AddRam Elite (parallel & serial ports)

Memory installed	64K	128K	192K	256K	320K	384K	448K	512K
	$399	$459	$519	$579	$639	$699	$759	$819

AddRam Plus (Two serial ports)

STB

RIO PLUS ... for IBM-PC/XT ... 64k-384k ... memory installed ... 64K 128K 192K 256K 320K 384K ... $289 $339 $389 $439 $489 $539

Special Purpose Cards

HERCULES GRAPHICS CARDS ... $349
Amdek MAI Board ... $459
Paradise Multi-Function Card ... $399
Vista Disk Master ... $169
PLANTRONIC ColorPlus ... $379
TECMAR GRAPHIC MASTER ... $499
STB Color Graphics Board ... $389
QUADLINK ... $479
MULTIGRAPH Monochrome & Color Display Adapter ... $499 ... $75

Hayes Smart Modem

1200 ... $199
1200 ... $485
2400 ... $429

DYNAMIC RAM CHIPS

4116 (16K)	$1.50 ea 9:$12
4164 (64K 200 ns)	$5.95 ea 9:$50
4164 (64K 150 ns)	$6.95 ea 9:$60

DAVONG HARD DISKS

SIZE	INTERNAL with controller	EXTERNAL without controller	EXTERNAL with controller
10MB	$1,675	$1,795	$1,895
15MB	$2,155	$2,135	$2,235
21MB	$2,475	$2,535	$2,635
32MB	$2,955	$3,095	$3,195

18MB Tape Backup ... $1,435
18MB Tape Backup ... $1,595
Networking Kit ... $1,899

Sysgen TAPE BACKUP

10MB ... $CALL

5¼ DISK DRIVES

Tandon TM-100-1, full ht. SSDD ... $159
Tandon TM-100-2 ... $195
Tandon TM-100-4, full ht. DSDD ... $336
Control Data 9409 ... $225
Contr. Data 9428 ... $199
Teac 55B ... DSDD ... Sale! $169
National ... Sale! $165
Qume 142 ... full ht., DSDD ... $239

NEC SPINWRITER

3550 ... 200 cps ... $1,575
2050 ... $939
7730 ... $1,795
Above ... & ribbon

C. ITOH F-10

40 CPS ... $995
55 CPS daisywheel (parallel) ... $1,349
... $225

ABATI LQ 20

... $435
... $99

ROLAND DXY 800 Plotter

Now includes free software

... $895

The POWER DIRECTORS

P2 ... $125
P12 ... $189

EPSON

FX-80, 160 CPS, 80 Col., friction & tractor feed, parallel ... Call
FX-100, 160 CPS, 132 Col., friction & tractor feed, parallel ... Call
MX-80F/T, 80 cps, 80 col., tractor and friction feed, parallel ... CALL
MX-100F/T, 100 cps, 136 col., tractor, friction feed, parallel ... CALL
RX-80, 120 cps, 80 col., tractor feed only, parallel ... CALL
RX-80F/T, same as RX-80 but includes tractor ... CALL

STAR GEMINI

Gemini-10X, 120 CPS, 80 Col., friction & tractor feed, (parallel) ... $Call
Gemini-15X, above w/15" platen ... Call
Delta-10, 160 cps, 80 col., parallel ... Call
Delta-15, above but 15" carriage ... Call
PowerType, 18 cps, daisywheel ... CALL
Radix-10, 200 cps, 80 col., parallel ... CALL
Radix-15, 200 cps, 132 col., parallel ... Call

C. ITOH

8510AP Prowriter, 120 cps, 80 col., graphics, parallel ... $339
8510-SP, above but 180 cps ... $CALL
8510-SCP, above but with color ribbon and yellow, blue and red ribbon ... Call
1550 Prowriter II, 120 cps, 136 col., 2K buffer, friction & tractor feed ... $525
1550-SP, above but 180 cps ... $CALL
1550-SCP, similar to 8510-SCP but w/ ... $CALL

IDS PRISM

IDS Prism 80, ... $1,159
IDS Prism 80C, above + 4 color ... $1,299
IDS Prism 132, ... $1,395
IDS Prism 132C, above + 4 color ... $1,495

TOSHIBA

Super letter-quality printer w/ 24-pin ... head, 192 CPS draft, 100 CPS letter-quality
P1351, 132 col., (parallel) ... $1,499
P1340 ... Call

MANNESMAN TALLY

160L, 160 cps, 80 col., friction & tractor feed, serial & parallel ... $585
180L - Like 160L, 136 col. ... $799

OKIDATA

ML-82A, 120 CPS, 80 col. dot matrix & friction feed, serial & parallel ... $319
ML-83A, 120 CPS, 136 col., tractor & friction feed, parallel/serial ... $595
ML-84P, 200 CPS, 136 col., friction & tractor feed, (parallel) ... $965
ML-84S, above but serial ... $1,059
ML-92P, 160 CPS, 80 col., friction & tractor feed, (parallel) ... $CALL
ML-92S, above but serial ... $599
ML-93P, 160 CPS, 136 col., tractor & friction feed, (parallel) ... $739
ML-93S, above but serial ... $799
2410P, 350 CPS, 136 col., friction & tractor, 2-color, (parallel) ... $2,295

BROTHER HR-25

New! ... daisywheel printer w/ 2 color printing, 3K buffer, proportional spacing, etc. Parallel ... CALL
Tractor for HR-25 ... $119
Cut Sheet Feeder for HR-25 ... $199

BROTHER HR-35

New! 35 CPS ... printer ... CALL

DYNAX DX-15

Letter-quality bi-directional printer with 2-color printing, bi-directional proportional spacing & bold printing, numerical keypad, 13 CPS, 3K buffer.

Parallel interface	$CALL
Cut-sheet feeder	$199
Tractor	$119
Keyboard	$179

JUKI 6100

18 CPS daisywheel, 11" platen, 2K buffer, 1 pitch, (parallel) ... $435
Tractor for 6100 ... $120

All merchandise is brand new & fully guaranteed. All prices reflect 3% cash discount for full payment by cash, cashier's check or money order. Personal or company check requires 2-3 weeks to clear. Visa, Master, American Express cards & P.O.'s accepted from qualified customers. COD's accepted with 20% paid deposit plus $3 COD fee (by UPS only). No COD's to Canada or FPO/APO. Shipping, insurance, handling charges: 3% of total order value by UPS Surface, 6% by UPS Air & Parcel Post (Min. $3). Calif. residents add sales tax. No returns on discontinued items. Prices & availability subject to change without notice.

EASTERN ENTERPRISES, INC.

Mail Merchandising Since 1969

2937 S. VAIL AVE., LOS ANGELES, CALIF. 90040

(Hours: Monday-Friday 8:30am-4:30pm Pacific Time)

TOLL-FREE (ORDERS ONLY) (800)392-7081

Calif., Alaska, Hawaii & all info Call (213) 725-3080

CIRCLE 235 ON READER SERVICE CARD

TWICE AS MUCH SPEED. 100% MORE CORRESPONDENCE.

To get as much from an IBM printer, you'd have to buy two.

Compare. Compare. Compare performance characteristics between Okidata's outstanding ML 92 and 93 printers and the IBM 5152 Model 2 printer, and you'll quickly find there is no comparison. For a few dollars more, the Okidata ML 92 and 93 offer three high speed modes: 160 cps bidirectional data processing (complete with short line seeking logic); 80 cps emphasized and enhanced printing for drafts; 40 cps for high resolution correspondence quality printing and other business communications. And complete graphics capabilities that are over 50% faster than IBM.

The IBM 5152, on the other hand, offers 80 cps data processing and no correspondence quality whatsoever. Your choice? An 80-column ML 92 or its 136-column partner, the ML 93, for all your DP, graphics and correspondence needs. Fast. Or, an IBM 5152 and something else (a daisywheel, perhaps?). Without the speed you need.

Plug 'n Play Makes It Easy. Because we've created the Okidata Plug 'n Play interface kit, your Okidata printer is perfectly compatible with your IBM computer and software without modifications. Here's how simple it is:

- Two replacement PROMs adapt the ML 92 and 93 to all IBM commands.
- An optional cable links computer and printer to provide instantly-responsive 160 cps bidirectional speed for DP, 80 cps for drafts, or 40 cps for correspondence quality.

That's that. In addition, you get Okidata's built-in printer reliability in the form of our long-life, 9-pin print head warranted for one full year, and a 4000 hour MTBF and 15 minute MTTR rating. Plus a 90-day warranty on parts and labor. And a warranty claim rate that's a leader in the industry: less than ½%.

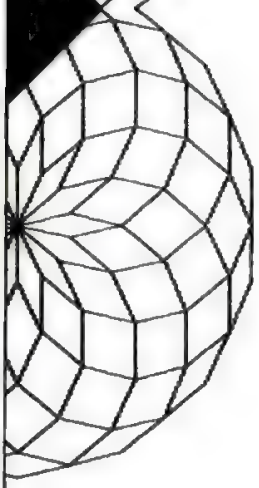
Liberate Your Computer. Don't limit the power of your IBM PC with a printer that can't keep up. Ask for a demonstration of the ML 92/93 and Plug 'n Play winning combination.* Phone 1-800-OKIDATA (in NJ, 609-235-2600) for the Okidata dealer nearest you. Or write OKIDATA, Mt. Laurel, NJ 08054.

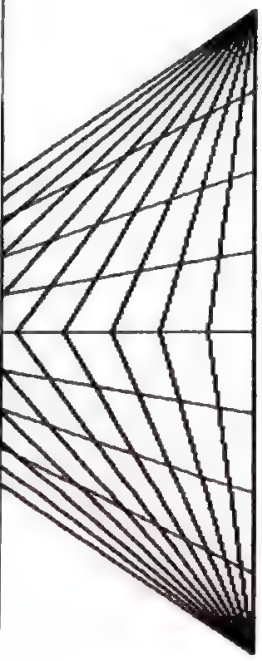
OKIDATA

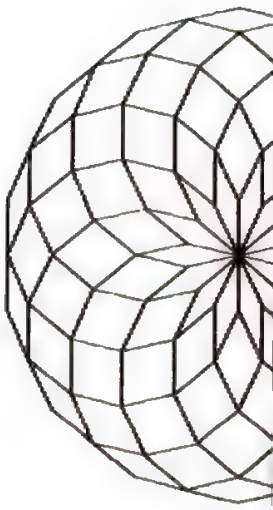
CIRCLE 285 ON READER SERVICE CARD

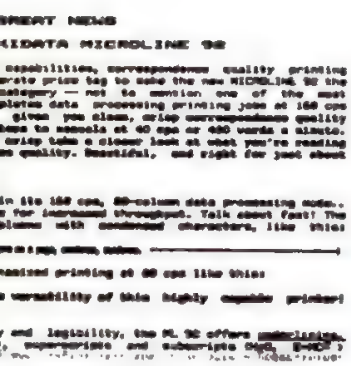
*12 cpi and downline loading character sets are not available with Plug 'n Play

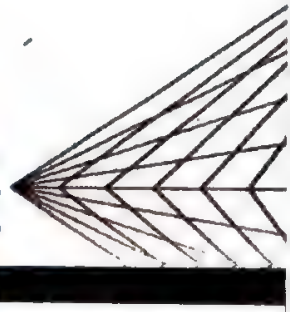
Graphics shown courtesy of



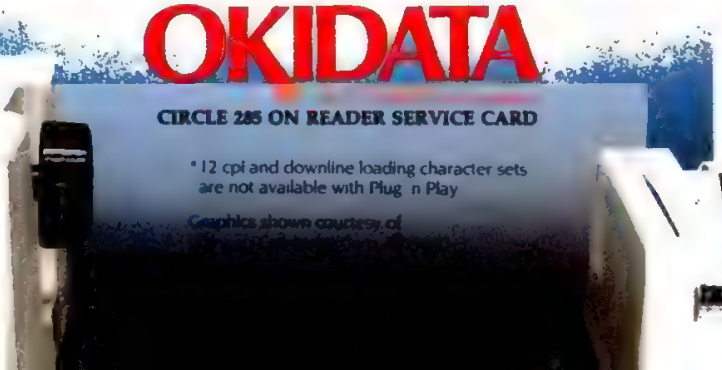














PROJECT: DATABASE

Part 4

In this installment of PC's six-part series, we cover all of the Category 2 databases—those that can handle more than one file at a time.

In the last installment of Project: Database we wrapped up the Category 1 databases—those that can handle only one file at a time. In this issue we'll unwrap the Category 2 packages.

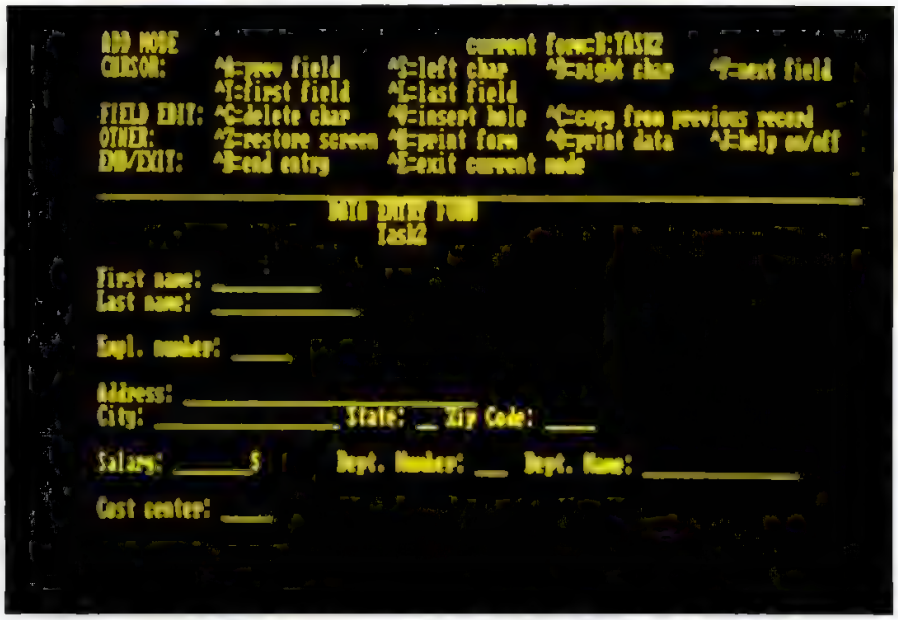
These databases must be able to work with at least two files in some of their functions—perhaps during data entry or for creating reports. All but one of the databases in this category are relational, and many of them also include a query language that lets the user get information from the database selectively

At the low end of systems that fall in this group, *TIM IV*, *KeyBase* and *FORESIGHT DATA MANAGER* offer simplicity rather than lots of power. *PC-FILE 'N REPORT* enhances its power with a table lookup feature, while *InfoStar* uses relational operations to combine data from as many as 16 files.

Three of the packages fall squarely in the middle of the second group. *ASAP FIVE* is truly relational. *KeepIT* can link several files and has a query language. *R:BASE SERIES 4000* includes a powerful English-like query facility.

At the high end of this category, *10 BASE* provides an easy-subset of SQL, and *ALADIN* offers its own fast query language. This medley of products makes for a Project: Database package worth unwrapping. —**Stephanie Stallings**

InfoStar: Family Traits



The Add mode in *InfoStar*'s database module, *DataStar*. Note *WordStar* control characters on menu.

InfoStar is MicroPro's name for the combination of its database manager, *DataStar*, and report writer, *ReportStar*. *InfoStar* is a powerful and flexible tool, but it requires some study before you can properly take advantage of its many features. It allows both dynamic and physical joining in its relational operations, is miserly of disk space needed for data manipulation and storage, and produces highly complex reports with many *WordStar*-like enhancements.

The documentation comes in three IBM-style three-ring binders with a typeset, copiously illustrated text. *DataStar* is resident on a single disk, *ReportStar* on two. Two extra disks provide a tutorial for *ReportStar* and some practice data files. The tutorial is a superb introduction for the novice but slow going for the database-initiated. Unfortunately, there is no manual for the tutorial; you must leap in and boot it up. *DataStar* and *ReportStar* feature additional lengthy, step-by-step instructions that take you through some rather complex procedures with minimal confusion. The manuals' extensive reference sections contain detailed explanations for operations.

InfoStar is essentially menu-driven, with multiple help messages that list the *WordStar*-style Ctrl-key command combinations. Error messages consisting of short sentences appear either during data entry or after form generation. The messages usually refer you to further discussion in the reference sections, and uncorrected mistakes usually bounce you out to DOS. In fact, when learning the ins and outs of *InfoStar* you will find yourself spending a lot of time in DOS, pondering how to redo your last routine to take advantage of more of *InfoStar*'s many options.

Micro Pro
International Corp.
33 San Pablo Ave.
San Raphael, CA 94903
(415) 499-1200
List Price: $495
Description: Relational
Requires: 96K RAM, 1 disk drive.
Records per File: 65,535

CIRCLE 668 ON READER SERVICE CARD

Free-form Data

DataStar, the data manager portion of *InfoStar*, provides a screen for free-form generation of data entry forms. In addition to "painting" the entry form any way you want it on the screen, creation of the entry form involves specifying data types, calculated fields, automatic conversion to upper case, required fields, necessary verification, and data entry from other files. The same form is used to query the file, retrieving records one at a time by file order, index order, or as a match for specified conditions. Browsing of entire data files is not supported as such, but the disk files are pure ASCII and may be accessed through DOS or a word processor. Entry forms may be up to three pages wide and several pages long, so you can probably make exact copies of the paper forms you are using right now. *DataStar* uses files



with variable length fields, but updated entires are overwritten in the file, if possible, or written to the end of the file if necessary. An additional nicety associated

Illustrations: Phil Anderson

ields is
ns in the
le as long
much as to
ly entered.
e files created
entry forms. The Quick
as you output a stan-
numbered pages
ubtotals, and totals
ge, or report. Sorting
key groups of fields.
feature does not print
negative numbers,
You can develop much more flex-
ible customized reports that include fields from up to 16 separate files. The report format (up to 255 columns wide and 255 lines long) is developed on a screen to include headers and footers for both the entire report and its individual pages, embedded *WordStar* printing codes, and nonprinting fields. In the report definition module, many optional arithmetic and logical operators for specifying variables and calculated fields are available. Other field conditionals include LOAD WHEN, UNLESS-THEN, output of field to file, right justify, and pad and float character selection. You can have the report output to printer or file but not to the screen. You can examine the output on the monitor only by displaying the disk file through DOS (which is hard to read because of flickering during scrolling) or with a word processor. Output to disk of a report extracting fields from two or more files that have different field specifications, but that share one key field, effectively creates a new file with those fields (an intersection relational operation). When a file is output, a view of the record format is displayed on the monitor, but the records themselves do not scroll past.

A Special Sort

A special sort program will sort a file on up to 25 key fields, as specified in the file's associated data entry field definitions, by either overwriting the original file or creating a new file. This facility will also perform file maintenance and will merge from 2 to 24 files that have identical field structures.

InfoStar is undoubtedly well endowed and will appeal to those who need sophistication and flexibility in a relational database manager. *WordStar* users will feel especially comfortable with *InfoStar*, which was designed to interface with *WordStar*, *CalcStar*, and *PlanStar*. MicroPro has recently released another *Star* family member, *StarBurst*, a menu-building program that will also execute stored scripts with *InfoStar*.

In doing an ad hoc query of information from the two test data files, I created a report screen that listed the fields I wanted reported. One of the fields was required to be the key field shared by the two files, but I did not want this printed, so I placed it in a nonprinting line on the format screen (marked by a dot at the left). I then sent the report to a disk file to be read later. To do a second report that listed all the fields in both test data files and sorted them by salary within department, I created a new report screen with all files listed, output the report to file, and then sorted this new file by the two fields. I made several false starts in developing these reports, mostly because key fields and index fields must be designated very carefully and the operations are complex and tedious. The introductory section of the *InfoStar* manual devotes little attention to relational operations; however, these are fairly straightforward once you have read the right pages in the reference section.

There are a few rough edges in *InfoStar*. The cursor can outrun the program and just disappear for a while. When you create report screens, you can move the cursor to the right over characters a space at a time with Ctrl-key combinations, but you must move it over blank spaces with the space bar. Some refinements are missing in this otherwise-loaded-with-extras package: You will not find support for IMB graphics symbols; password or encryption; special date or time conversions; inverse video; or designation of integer, real, dollar or date fields with associated automatic floating characters, decimal points and space characters (you must designate parameters and calculations associated with these special fields yourself).

The give and take between flexibility and ease of use seems to be weighted towards the former, and *InfoStar* procedures are complex and sometimes tedious. *InfoStar* would be most agreeable to someone who likes its *WordStar* Ctrl-key commands and nonsimplified data definition methods.—**Richard Zander**

(Continued)

```
Name                    Empl. Num.   Address
 Dept. Num.  Dept. Name     Salary

Doug Williams            120740       P.O. Box 57165
                                        Washington DC 20037
 100  Accounting              12000
Ted Wicklind             150140       9734 Grant St.
                                        Omaha NE 68134
 100  Accounting              12000
Carl Swann               143840       PO Box 2141
                                        Chesapeake VA 23320
 100  Accounting              12000
Marshall Partridge          148040       2608 Eighth St.
                                        Berkeley CA 94710
 100  Accounting              12000
Ione Owens               125990       9083 Sunflower
                                        Alta Loma CA 91701
 100  Accounting              12000
Mark Milton Clarke       154340       51 Fremont St.
                                        Needham, MA 02194
 100  Accounting              12000
```

A custom report of the employee database in *InfoStar's* report module, *ReportStar*.

PROJECT DATA BASE

TIM IV: Mature Power



The employee record format as designed with *TIM IV*.

TIM IV *(Total Information Management)* is a mature, easy-to-use database program whose capabilities approach those of relational database packages.

It offers all the features standard to simple, single-file database programs in a tidy, easy-to-understand and well-documented package. In addition, it offers some less common, although limited, two-file capabilities.

TIM databases are simple to create. Field names, lengths, and types are specified on a layout sheet that lists most of the available options. Besides standard character and fixed-point numeric data types, *TIM* allows calculated fields (the total of sets of fields, or the simple arithmetic functions of another field) and what it calls "inverted fields."

Inverted fields are most commonly used with people's names. In this case, it is efficient to enter and store the name as "John Doe," but it would be nice to be able to sort and search it as if it had been entered as "Doe, John." *TIM*'s inverted fields do this automatically. The same principle also applies to fields defined as dates. Dates can be entered in either a month/day/year or a day/month/year format, but they are sorted in chronological order, as if they had been entered year/month/day.

TIM provides a default layout for input screens but allows you to specify your own screen for any file. Unfortunately, neither of these approaches is particularly successful. The default screen displays a blank immediately beside the field name for data, but the field names are lined up along the left-hand side of the screen. Consequently, the blanks for the data don't line up u… names is exactly t…

You can specify y… layout, but only one … screen must display the … cannot display any othe… instructions. It requests fiel… order the fields are named in th… instead of the order the fields appe… screen. If you have designed a file … for example, names and addresses … and telephone numbers last, but are co… ing the information from a form where the telephone numbers appear beside the names, you are able to make the screen look more or less like the form. But you'll be asked for the telephone numbers at the end, and your eye will have to travel all over the input form—exactly what you were trying to avoid by specifying an input screen. Of course it's still better than not having a custom input screen at all.

TIM stores data in the order records are entered, in fixed-length fields. Any number of fields can be designated as index fields, and a separate index file is created for each of them. Indexes are compact—only 2 bytes in the index for each record in the database. New records are accumulated, and indexes are not updated until data entry is complete. Index updating can be postponed, although any search or report function that depends on the index will also have to be postponed. Indexes can be added or deleted at any time. Adding a new index to a 500-record test database took about 2 minutes, where the index was on two fields. This process is equivalent to sorting, and *TIM* does not have any other sorting processes.

Searching for records on screen can be done only according to a single field at a time. If the field is an index field, *TIM* knows to search according to the index and can find any record in 4 seconds or less. If the field is not an index field, a sequential search is done. Using a sequential search, *TIM* found a record in the middle of our 500-record test database in about 1 minute.

Extracting records is more sophisticat-

Innovative Software, Inc.
9300 W. 110 St. #380
Overland Pk., KS 66210
(913) 383-1089
List Price: $395
Description: Flat files, with some multifile capabilities.
Requires: 128K RAM, 2 disk drives, DOS 1.1.
Records per File: 32,767

CIRCLE 669 ON READER SERVICE CARD

ed process. Record selection criteria can be fairly complex, and extraction to a file produces a completely new database. Extraction specifications are saved for future use, and the specifications can include variable information for which you are prompted each time the extraction is run. If, for example, each month you wanted to extract all the records altered that month, and date of alteration was the fifth field in the file, your extraction specifications might read

```
FLD 5 GT **
```

The ** would cause *TIM* to request a value at each execution of the extraction.

Extracted records, or the entire database, can be reported on simple tables or in more complex formats. *TIM* offers a Quick Print option, which is a sequential dump of the file. If that is not sufficient, *TIM* can print a tabular report, typically one line per record. Tables can be printed according to the order of any index field. Totals and averages for any numeric field, as well as counts of the number of records, can be reported at any change in the index field or at the end of the report. A report can contain any of the fields in the file. Formatting is limited! Column headings must be the name of the field, and columns are separated by a single space.

TIM also allows a severely limited selection of fancy report formats. The specification of report formats is awkward and somewhat inflexible. Mathematics and summaries are not possible. Trailing blanks within a field cannot be deleted. Each record in the database is printed on a single page in the report. Formatting is one of *TIM*'s least impressive features.

In two situations, *TIM* can work with two databases at once. The two databases must contain a common "link" field, which must be an index field.

In a tabular report, *TIM* can extract and print from the secondary database, all records with the same value as the link field in the current primary database record. It can also total fields from the secondary database. Databases set up for testing included a small Departments database, which listed five department names and code numbers, and a People database containing 500 personnel records, each of which included a department code. *TIM* could be instructed to print the Departments database and, for each of its records, to find, print, and total the relevant personnel records.



TIM includes many features that are not essential, not very sexy as marketing tools, but that are nice to have.

TIM also allows two types of two-file transactions: posting and look-up. Posting means accumulating in a summary database (such as the Departments database) information from the records in a detail or transactions database. Look-up, naturally enough, means finding information to fill one field by looking up the value of another field in a second database. For example, you might fill in a "department name" field in the People database by looking up the department code from the people record in the departments database.

This is the limit of *TIM*'s two-file capability. It does not permit fancy-format printouts that use two databases, Look-up during data entry, or any other functions. It's a start, but not enough to classify *TIM* as a second-level product.

TIM has been on the market for 4 years, certainly time enough to collect feedback and make improvements. It consequently includes many features that are not essential, not very sexy as marketing tools, but that are nice to have. The Quick Print feature is one; others include listing and counting records by key; file password-protection; tools that make it easy to create a new database that is similar to an existing one; easy loading of standard ASCII files into a database; and generating files that can be used as input to *WordStar*, *VisiCalc*, *Magic Wand*, and a half dozen other programs. You are provided with a set of BASIC subroutines that make it easier to write programs that use your *TIM* files. There are utilities that allow you to reconstruct a damaged database file. Also included is a fine set of example applications, described in the manual and accompanied by appropriate files on a tutorial diskette. The manual includes a detailed description of the file structure and organization.

The *TIM* manual is clear, well organized, and arranged into chapters that exactly match the choices on the *TIM*'s main menu. Each chapter walks you through all the prompts and possibilities a particular menu choice can produce. The manual's index is weak, but the manual is otherwise excellent.

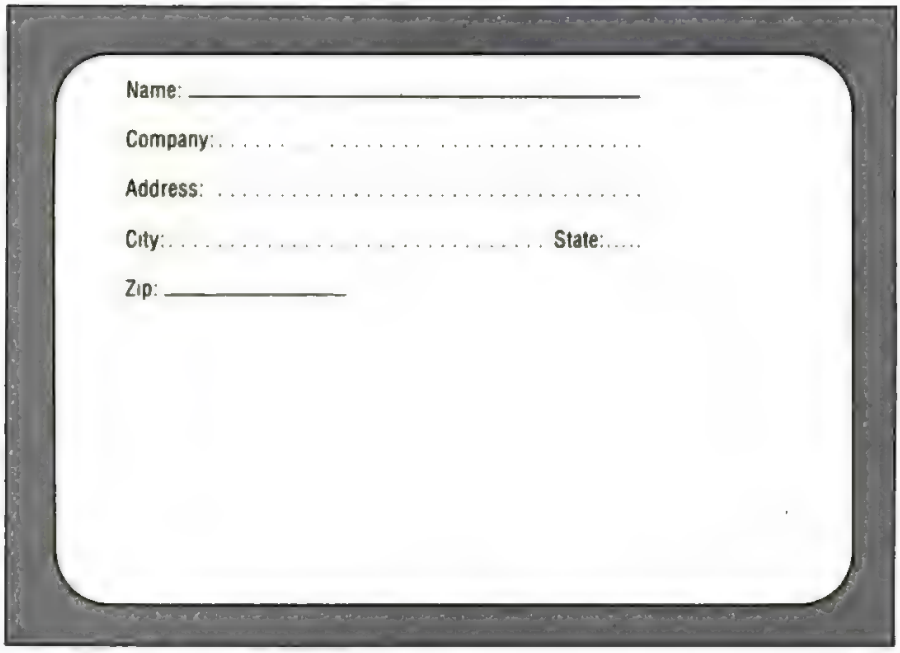
TIM remains a bit of a puzzle. The program is powerful and sophisticated—and evidence that a talented software designer was at its heart. But perhaps it's more of a programmer's program, rather than an amateur user's program. It works well, and its extra tools will delight those who want to know more about how it works, or who want to make other programs work with it. Yet its input and output have real weaknesses, which make the package more difficult to use than it should be. Could it be that its talented designer had trouble imagining how the real world of data-entry clerks, forms design, and statement and invoice printing works?

— **John Helliwell**

(Continued)

PROJECT DATA BASE

ALADIN: Practice Makes Perfect



Data are entered on an *ALADIN* screen form.

I admit to having a prejudice against Pascal software. In my experience, Pascal applications programs are over-large and slow. As soon as I saw *ALADIN* sign on with a UCSD p-System banner, I expected the worst—but, I confess, I was wrong. *ALADIN* is small, fast, and capable. The program makes few unique demands on the hardware and contains many features. *ALADIN* was developed in West Germany; perhaps German programmers understand a few practical things about using Pascal that North American programmers don't.

ALADIN is advertised as an interactive and menu-driven program. It is both of those things, but I am not convinced that either of those attributes makes it any easier to construct and use a database. The menu structure hides many of the programming tasks from you, as it is meant to do. But several important tasks are not included in the menu plan, and they must be performed through at least two diverse methods of entering commands.

For example, the interactive menu feature helps you create the fields and relationships in the database. You are given options and selections to choose from, and the program makes things easier by entering information for you in repeated fields and related files. But if you want to change or specify the designation of the disk drive holding your data files, you can search in vain for a menu choice to help you do it. This selection is one of several options (not prompted) that you can select when the program first signs on, but you can't get at it through the menu structure. Similarly, if you want to change the file you are specifying, there is no menu selection to help you do that either. (The JUMP command sometimes appears on the menu, but it doesn't always work.) This action is one of several options (not prompted) that involve the use of the Esc key and a numeric command. It takes a lot of digging through the manual to find the options you can choose at sign-on and those that require the use of the Esc key plus a number. A program should provide a consistent way of choosing options; these three paths are too confusing.

Advanced Data Institute
1215 Howe Ave.
Sacramento, CA 95825
(916) 925-2229
List Price: $795
Description: Relational
Requires: 128K RAM (DOS 1.1), 192K RAM (DOS 2.0), 2 disk drives.
Records per File: 65,535

CIRCLE 670 ON READER SERVICE CARD

Give up Your Lap

If you like to use the PC keyboard on your lap, forget it. The *ALADIN* manual will occupy your knees until you have had a great deal of experience with the program. Some information is contained in a descriptive section in the back, but other information (such as how to read in data from files converted into the *ALADIN* format) appears only in the tutorial. Numerous addendum sheets in the back of the manual have no reference in the front. The *ALADIN* manual does not contain a phone number for the company, although I did get the number from information.

These complaints aside, *ALADIN* is a very capable program. If you use it on a regular basis, you can do almost anything with it. It could become a favorite among capable programmers who enjoy using Pascal. The options for statistical analysis, in particular, are excellent. If your database reports contain many numbers that are derived from multiple files, *ALADIN* could serve you well.

ALADIN'S Magic Module

If you want to create a new database with *ALADIN*, you have to ask for the installation module when you type in the name of the program. That is the only time you can get to it. This module operates with many of the same prompts and keystrokes as the data processing section, but it has different capabilities. *ALADIN* asks you for the name of the database structure you want to create and allows you to identify the major files in that database. The

program then takes you through each field and helps you select the type of data going into the field, the field length, and attributes such as field protection and linking to other files. This specified field linking is an important feature. Linking puts identical fields in more than one file and allows them to be changed simultaneously. You must also specify the key fields at this time. These are the fields that will be used to look up records.

While you are in this database design session, you can back up and make changes to fields or files you previously defined. In my experience, however, some of these changes did not seem to "take" after the first time through. Once you close the session and save the descriptions, the modifications you are allowed to make are very minor; you can't even extend the length of a field. If you try to make more than superficial changes to the database structure after you have entered data, you will lose your data files. You can save your files under another name and then "import" them back into *ALADIN*, but you should give very careful consideration to the structure before you enter a large amount of data.

An important limitation of *ALADIN* is its inability to use fields designated as integers or money in a multilevel sort. When I ran the *PC Magazine* tests, I tried to sort on salary and nearly lost all the hair on the top of my head in frustration. The specialists at ADI America finally wrote step-by-step instructions for me: Their solution was to create a separate character field that contained the same numbers as the numeric field I wanted to sort on. I could use the character field for sorting and the numeric field for mathmatical and statistical functions. Of course, this kind of construction eats up disk space and really complicates the problem of importing data. This trick is only valid if you change the numbers in the character field every time the numeric field changes.

ALADIN draws a data entry form on the screen after you describe the fields you intend to use. You can move the blanks in the form around the screen, but you can't change them in any other way. This automatic form generation is a nice feature, and the editor you use to modify the form works well.

You can enter data into the database system from the keyboard or from files that exactly meet the specifications of an *ALADIN* file. The *ALADIN* manual claims that the program can convert a wide variety of data files into the *ALADIN* format. The program allows you to specify the characters used to set off the fields and character strings used in the "foreign" program. In practice, I found that it took a lot of juggling between the input file, the conversion utility, and the input utility to create a file that *ALADIN* really liked.



Another interesting ALADIN function is its ability to merge certain fields from selected records in its database with a text file prepared on a word processor.

The entry of information from an existing *ALADIN* file is another department in which the menu structure only takes you so far and then drops you off. A menu option selects input from a file, but you are expected to either know or search the manual to find out that you have to enter a carat (^) into each field you want to read from imported file.

The keyboard entry works as expected. You move to the next field automatically when a field is filled or the Return key is pressed. If an entry does not match the form you specified, the program sounds a beep and displays an error message. You have to acknowledge the error message with the F1 key before you can go on.

Informal data retrieval with *ALADIN* is easy. The program gives you the ability to browse through the records, make changes to data within fields, and make fast ad hoc queries. You can call broad categories of records simply by putting the cursor on a field *ALADIN* draws on the screen and entering the information you want to match. You can make these entries with wild-card specifications that tell the program to search for the closest match.

ALADIN has a query module that functions differently from the query languages often associated with database management systems. The *ALADIN* query module is an on-line editor that is always present, but its function is optional. You can use the menu-driven query commands to describe conditions on which you want to select information for output and to filter entered data. You can use all of the common logical arguments and conditions such as *and*, *or*, *greater than*, *smaller than*, *equal*, and *not equal* to consider any or all of the fields in every record. But describing conditions in a query such as "The color is blue and the price is over $1,000" does not immediately result in any output. The *ALADIN* query module simply allows you to create a written

description that you can call later to filter data entry, generate reports, or make data inquiries. This interesting concept extends the idea of a data editor and makes it more flexible, but the possible confusion with more traditional types of query languages is unfortunate.

Merging Traffic

Another interesting *ALADIN* function is its ability to merge certain fields from selected records in its database with a text file prepared on a word processor. You can use the output files from many different word processors, including *WordStar*, *Volkswriter*, *MultiMate*, and the USCD Pascal editor. A typical application would be the merging of selected addresses from the database with a standard text file for a mass mailing.

The *ALADIN* report module has excellent abilities to retrieve and compile information from multiple files and to format a good-looking printed report. You can perform calculations as a part of the report generation process. The *ALADIN* calculator program can create simple bar graphs and scatter diagrams that you can incorporate into reports.

ALADIN includes a script language that lets you write a script of tasks for the program to execute. A script file would typically be used to move the program to the report generation module, call a report format, and run the report. In this way a single command can result in a finished and standardized report.

ALADIN operates well in systems that have a minimum amount of memory and only floppy disk drives. It has strong capabilities for generating statistics and printed reports and does an excellent job of providing referenced access to character information in multiple files. It is not, however, a program you can just pick up and use. *ALADIN* takes time and practice to learn and use effectively. It is not inexpensive, and you should be sure you need all of its capabilities, particularly statistical, before you pay the price.

—Frank J. Derfler, Jr.

R: BASE SERIES 4000: Make Room for Data



An example of an *R:BASE SERIES 4000* data entry form for an employee record generated for Project: Database.

Microrim has gone to great lengths to make *R:BASE SERIES 4000* easy to use. First of all, because *R:BASE* makes use of 256K of RAM, the first of the two system disks is retained entirely in memory, and the second is kept in drive A: to provide an overlay. Thus, you do not have to change system disks to bring up program modules necessary for some database manipulations as is the case with most full-featured data managers.

Microrim, Inc.
3380 146th Place SE
Bellevue, WA 98007
(206) 641-6619
List Price: $495
Description: Relational
Requires: 256K RAM, 2 disk drives, DOS 1.1.
Records per File: 2.5 billion or limited by disk space.

CIRCLE 671 ON READER SERVICE CARD

The well-written tutorial booklet and the demo disk take you painlessly through two good, true-to-life workplace examples requiring various database exercises. You actually feel you understand what is happening, which is impressive in a command-driven database manager. The documentation (an IBM-style three-ring binder of a little less than 300 pages, nicely printed on glossy stock) is directed to the needs of the novice and is well organized. Looking up information is easy with its good index, various type fonts that accentuate key words, and a separate booklet listing the various commands with their associated parameters and special syntax. Large card tabs separating the different parts of the manual are an immense help and make the manual a great deal more accessible.

R:BASE operations are controlled by command lines that state, essentially: "Do this to that under these conditions." A Help mode lets you read extensive expla-

nations of the various commands and their functions from the screen at any time. A second line of support for the beginner is a Prompt mode that provides a short synopsis of a specified command at the top of the screen, and a prompted "fill in the blanks" section below that guides you through the correct syntax of the command line. The Help and Prompt modes are optional and need not be used if you think you have mastered some or all of the commands, but these modes can be entered at any time. In fact, you can rewrite the prompts to provide yourself with whatever information you think you will need. This is a more efficient system than nested menus that all users, novice and adept alike, must step through. It's a good thing, however, that help is as close as your screen, because new owners get free help from Microrim only for the first 30 days. "Extended Support Services" cost an additional $150 per year, and the information hotline is not a toll-free phone number.

Chapter One

The first chapter of the manual is a good introduction to *R:BASE*, discussing the Help and Prompt features and describing how to open a database, exit, and set defaults for certain functions (expression of dates, bell on, error off or on, lines per page). It does not, however, tell you how to work with relational databases in general. To learn how to set up your data files if you're a novice, ask a data processing expert to recommend a good introductory text.

Entering data in *R:BASE* is quite efficient. Its custom screen forms are good-looking and easy to create. You can place any text (including fully spelled-out field names) anywhere on the screen and then position the data entry fields relative to the text prompts. You can easily add prompt lines, notes, lists of abbreviations, and even IBM ASCII graphics to the form. After you finish entering data on a form, you can go back and modify any field you have previously entered, if necessary. It



The well-written tutorial booklet and the demo disk take you painlessly through two good, true-to-life examples requiring various database exercises.

then takes just two keystrokes to add the data to the file. (It would have been helpful if *R:BASE* made better use of the function keys.) Files from *dBASE II*, *Multiplan*, *VisiCalc* and *1-2-3* are easily transported into *R:BASE*.

You can have the program check the data you enter to make sure that the spelling is accurate and that the data is within a specified range of values by creating a Rules file for a particular data file. The Rules file provides for simple comparisons of up to ten values or for "table look-up" of complicated data entries, such as checking to see that postal abbreviations for states are correct. Rules checking also allows you to use arithmetic operators and requirements to include certain text values in the entered data. If desired, you can require that a particular data field be filled, and you may devise your own error messages for nonfulfillment of a data entry criterion.

Unfortunately, *R:BASE* contains no browse function as such. Horizontal scrolling, present only in the report creation facility (to allow formatting of up to 132 columns) would have helped display all fields when you are querying files with many fields. You can, however, get around this problem by either querying the database about just those fields that will fit on your screen (at one record per line) or by defining a report format that produces a multiple-line record retrieval. A third possible option is to use the Edit feature that calls up individual records using a data entry form.

Believe It or Not

The English-like query language is simple, but it includes some powerful options. Believe it or not, the typical *R:BASE* command line query, SELECT fieldname1 fieldname2 fieldname3 FROM filename WHERE condition1 and condition2 SORTED BY fieldname1, is, after a few run-throughs, fairly obvious and easy to remember, especially when you are rewarded with data obtained under *R:BASE*'s touted fast retrieval time (1,000 records sorted on one key in 59 seconds). Basically, you are limited to querying one data file at a time and can do relational algebra on only two files at a time, although you can update and modify fields on all files in the database with a global function. Getting answers that depend on information in more than one file requires two or more relational operations followed by a query. However, *R:BASE* excutes commands for these functions quickly. Its relational functions are extensive and can be set up quickly as well. You can easily combine two files into one large file, or you can form a third file with various selected combinations of fields merely by specifying conditions for inclusion or exclusion of records.

The report writer is plain vanilla. You

Input Screen Specification

Method	Capabilities				
	No. screens per file	No. files per screen	Simulate paper forms?	Link help messages/ prompts to a field	Master/detail relationships
"Painted"	1	1, though some merging possible.	Yes	No	Yes
Automatic, with limited "painted" screen capabilities.	1	1	To a limited degree	No	No
Programmed	64	1	Yes	No	Yes, excellent with linking between files prompted on [illegible]
Automatic/ "Painted"	Unlimited	1	Yes, 23 rows by 80 characters.	Extensive prompts or help messages can be added to the form.	No
"Painted"	1	1	Yes	No	No
Automatic	Unlimited	Unlimited except by number of fields on screen.	No	No	Yes, up to 3 indexed fields per screen, with each index a detail.
"Painted"/ programmed	Unlimited	16	Yes	Yes, both root and branching help files.	Only as index keys
Automatic/ "painted"	9, but all 9 must be part of same form.	1	No	No	Yes
Automatic	100	1	No	Yes	Yes

1. Follow instructions on the other side

Back

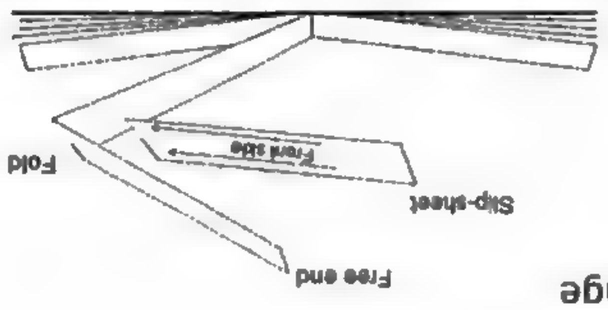
GbsSlipBack-0018

Inverted Back

1. Follow instructions on the other side

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

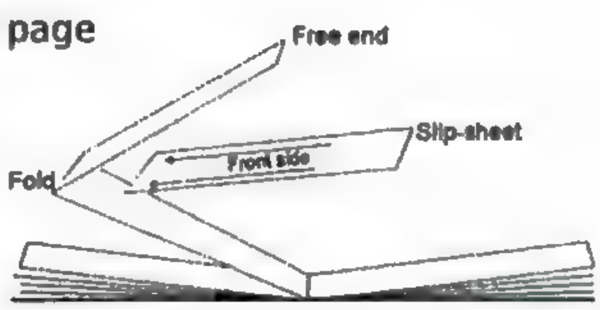


GbsSlipSheet-001

Folded edge of the page

Inverted Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
    1. Front side touching the free page
    2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



PROJECT DATA BASE

Name	Data Model	Marketing Features		
		Length of Time on Market	Number of Sales	Price
InfoStar MicroPro International Corp. 33 San Pablo Ave. San Raphael, CA 94903 (415) 499-1200	Relational	*DataStar* since May 1980; *ReportStar* since November 1982.	Confidential	$495; *DataStar* alone is $295; *ReportStar* alone is $250.
TIM IV, Total Information Management Innovative Software, Inc. 9300 W. 110 St. #380 Overland Pk., KS 66210 (913) 383-1089	Flat file, with some 2-file capabilities.	Since 1982	40,000	$395
ALADIN Advanced Data Institute 1215 Howe Ave. Sacramento, CA 95825 (916) 925-2229	Relational	Since December 1983	24,800	$795
R:BASE SERIES 4000 (Version 1.1) Microrim, Inc. 3380 146th Place S.E. Bellevue, WA 98007 (206) 641-6619	Relational	Since September 1983	Confidential	$495
PC-FILE 'N REPORT (Version 2.0) JASPIR International, Inc. 24 Salrit Ave. Waldwick, NJ 07463 (201) 445-8535	Relational	Since December 1983	1,000	$195
ASAP FIVE ASAP Systems, Inc. 2425 Porter St. #14 Soquel, CA 95073 (800) 345-2727	Relational	Since November 1983	1,000	$395
10 BASE Fox Research, Inc. 7005 Corporate Way Dayton, OH 45459 (513) 433-2238	Relational	Since December 1983	1,000	$495
KEEP IT (Version 2.1) ITSoftware P.O. Box 2392 Princeton, NJ 08540 (800) 222-0592	Relational	Since September 1983	4,000	$450
KeyBase SoftKey Software Products, Inc. 2727 Walsh Ave. Santa Clara, CA 95051 (408) 986-8148	Relational	Release date is July 15, 1984.	—	$375

cannot number the pages or ask for special fonts, although you can specify any number of footer and header lines. When printing, *R:BASE* remembers how many lines have gone to the printer and will find the top of the page for the next requested report output based on that number. Turning the platen to reposition the print head at the top of a page just confuses the program; it is sometimes best to exit and begin again. An Extended Report Writer that should become available from Microrim soon will provide a considerable amount of flexibility.

I had no insolvable problems when working with *R:BASE*, though it has a few odd quirks. For instance, the END command is listed in the Help menu. I was curious to find out how much help the program could provide about this kind of instruction, so I typed END at the prompt, which immediately ended the help session.

A more serious problem is the large storage space requirement for *R:BASE* data files. *R:BASE* keeps all its related data files in one large file called the database. You delete records and files previously marked for removal by rewriting the whole database to a new file; you cannot delete or perform file maintenance on just one data file at a time. If you are using floppies and do not have room for the new database in addition to the old one on either your system disk or your data disk, Microrim advises you to make preliminary computations of the space needed. If you find yourself out of space, you can type the word Reload, press the Enter key, substitute a blank disk for the system disk, and write the new, smaller file to the blank disk. The new version, 1.1, includes a fix for a previous bug that destroyed data if the file was rewritten into a space too small for it—you now get an error message and can start over. Potential buyers should estimate their disk storage needs as twice the largest size of their data files will ever become, plus space for the usual burden of records that will be deleted and for any new files created during relational operations. This is true for both floppy and hard disks. The new CLOUT Natural Language Interface for *R:BASE* will reduce these demands for space by producing relational reports from five files at once with dynamic joins, which do not require disk storage space.

I would recommend *R:BASE* for both novice and the seasoned database manager user who have abundant RAM and disk memory storage. Its well-written manual and Help and Prompt modes make *R:BASE* easy to learn. The data entry forms and reports can be highly customized and the query, report, and relational options are simple to use and powerful.

I would recomend R:BASE for both the novice and the seasoned database manager user. Its manual and Help and Prompt modes make it easy to use.

Command lines may be saved in a special file so that *R:BASE* can execute sequential instructions for standard queries and reports or other database manipulations. A simple word processor, RBEDIT, is included in case you do not have a word processor of your own and want to avoid working with DOS' EDLIN. The command file allows a degree of programming for data management operations, including definition and storage of local variables, creation of separate menus for special routines, and implementation of nested IF-THEN-OR and WHILE-THEN-OR commands. A forthcoming Program Interface package will allow Pascal and FORTRAN programs to have direct access to *R:BASE* databases.

An Ad Hoc Relationship

To do an ad hoc query of information extracted from the two files provided by *PC Magazine*, I simply performed a relational operation to create a new file that included the three fields I needed and a fourth field that was possessed jointly by the two original files. The three fields could then be listed on the screen with a query command that looked like this:

```
SELECT lastname empl:num
Deptname FROM file3
```

To create a report that listed all fields in both original files, sorted by salary within department, I combined the two original files into one with the command line:

```
UNION file1 file2 FORMING file4
```

I next formatted a report screen. I typed the word *Report*, entered a name for the particular report format I would create, then gave the name of the file that the report would work with. Using a menu of report-formating options, I then "painted" the report on the screen, placing headers and footers in the positions I wanted them; defined a variable, Count; located on the report, with the cursor, the positions the reported field values would occupy; marked header, detail and footer sections on the screen; and set the number of lines per page. With practice, you can probably accomplish this process far more quickly than I can describe it. The report format was automatically placed in a special report file database when I finished. To produce the report, I gave the command line:

```
PRINT reportname SORTED BY
salary deptname.
```

The report was then scrolled to the screen.

Though *R:BASE* performs many functions well, I would not choose it because of its immense disk storage requirements.—**Richard Zander**

(Text continues following the Database Chart.)

Entry Editing Capabilities

None	Range Tests	Specific Values	Default Values	Table Lookup (to an Outside File)	Verify (Requires Data to Be Input Twice)
—	Minimum and maximum, specific values.	Yes	Yes	Yes	Yes
—	No	Forces numbers in numeric fields.	No	No	No
—	No	No	No	Yes, but limited.	No
—	Yes	Yes	Yes	Yes, but cannot fill data-entry field from table.	No
—	No	No	No	Yes, multiple table files may be used.	No
—	No	No	No	No	No
None	—	—	—	—	—
—	Yes	Via table lookup	1 to 40 characters allowed, and value may be computed.	Yes, limit of 200 items for table lookup.	No
—	Yes	Yes, via table lookup.	Yes	Yes	No

Entry Editing Capabilities (cont'd)			Adaptation to PC		
Required Field	Date Tests/Date Conversion	Other	ASCII Characters Only	Graphics Symbols	Color
Yes	Must provide formula.	Batch processing supported for large data entry jobs.	Yes	No	No
No	Yes, limited.	Read-only protection for designated fields. Fields can be designated for linking to other tables upon entry.	Yes	No	Yes
No	Accepts dates such as Dec 23, 83.	No	No	Yes, can do charting.	Yes; foreground, background, field, title.
Yes	No	Fields may be automatically skipped.	Special IBM graphics characters in upper ASCII set supported.	Yes	No
No	No	No	Yes	No	No
No	Yes	No	No	Outlines areas of screen.	No
—	—	—	Yes	No	No
Yes	Accepts date in format (MM/DD/YY) or (DD/MM/YY).	Read-only protection for designated fields.	Yes, for data files; some binary information in the screen files.	No	Border is blue, text area has white foreground and black background.
Yes	No	No	Yes	No	White letters on blue background.

DOS 2.x Subdirectories	Alternate Input Methods (mouse, etc.)	Files Across Multiple Drives	Function Keys	User Interface	Files: Methods of Data dictionary or other means
No	No	No, but *InfoStar* will pause so you can change disks.	Yes	Menus	The entry form has a file definition sequence associated with it
No	No	No	Used effectively and consistently for commands and screen prompts.	Menus/prompting	Data dictionary stored independently of date file
Yes, but not well documented.	No	No	Yes	Good menus and interactive prompting	Data dictionary built through prompted session
Yes, but only one subdirectory at a time.	No, but can program keys with *ProKey*.	No	Yes	Prompting.	Data dictionary
No	No	No	Yes	Prompting, but prompts often too short.	Created when entry screen is designed
Yes, automatically creates ASAP subdirectory, but cannot access other subdirectories.	No	No, but has multiple disk backup restore capability.	Yes	Visual, with good use of reverse video, boxes, etc.; useful prompts.	Data dictionary
Yes	No	No	Yes	Visual/verbal; IBM SQL.	Data dictionary
No	No	No, but you can easily split files.	Yes	Menus	Creates a file definition file when creating data entry forms
No	No	No	No	Menu and user-provided prompting	Dictionary is embedded in program table

Files (cont'd)

Specification	Things You Can Specify				
Must files be built/modified only from data dictionary?	None	Field data	Tokens, aliases, or synonyms	Index data	Permissions/security
No, you can change the file definition at will, then enter any data to fit it.	—	Calculated field, constant, justification, pad field, must enter, auto copy, range checks.	No	Up to 25 fields to a key. Only 1 index allowed per file.	No
Yes, but utilities provided for reconstructing damaged files.	—	Length, name, type of field, whether it is a total or calculated field.	No	Any number of indexes per file.	No
Yes	—	Numeric, character, data, money, decimal.	No	Only as key fields	Read-only protection for designated fields.
No	—	Number of text characters, if key field.	A RULES command allows one of several possible values to be entered.	Any number of fields can be key fields, and any data type can be indexed.	Passwords may be specified at file level or for the whole database.
Yes	—	Alphabetic, alphanumeric, numeric, or dollar amounts.	No	No	No
Yes	—	Length, name and type.	No	May specify up to 3 fields as keys.	Read-only protection for designated fields.
Files are built with Define utility; data dictionary automatically updated.	—	Character, integer, decimal.	No	Yes, even after construction of the file.	No
Yes, but can override in specified situations.	—	Alphanumeric, integer, decimal, date.	Yes	Up to 3 independent indexes per file.	Passwords supported at data entry level.
No, can modify using an editor.	—	Length, type, picture.	No	May have a separate index for each field.	Password protection by application

					System
					Maximum No. Record Types per Database
Encryption	Relations	Validity tests	Error or prompting messages	Multiple views of database	
No	Yes	Checks length of entry, character type; refuses duplicate keys.	No	No, though effect achieved with merging technique.	Not limited by program
No	No	No	No	No	1
No	Yes, prompted and automatically inserted.	Checks data types	No	Yes, from different portions of the program.	32
No	Yes	Entry-editing rules define data validity.	Yes	Yes, using union, project, and intersect commands.	40
No	No	Through table lookup.	No	No	Unlimited. You can design any type of file you want.
No	Automatic relations set up while database is in use.	Checks field type, legality of dates.	No	Yes, through definition of multiple screens.	Not limited by program.
No	Described by the SQL language.	Yes, program controlled comparisons.	Yes	Yes	Not limited by program.
No	No	Checks date format.	No	No	Not limited by program.
No	File relationships are specified in the on-line dictionary.	Can do range tests.	Yes limited.	No	1

Specifications					Error Handling
Maximum No. Fields per Record	Maximum Record Size	Maximum No. Records per File	Maximum No. Records per Database	Maximum Field Size	
255	4,096 bytes	65,535	Can have up to 16 files open; hence have access to 1,048,560 records.	120 bytes	Field-by-field and total reprompting
40	2,400 bytes	32,767	32,767	60 bytes	Field-by-field
512	4,096 bytes	65,535	Can have up to 32 files open, so has access to 2,097,120 records.	1,384 bytes	Field-by-field, total and selective reprompting
400 fields per database. Fields are distributed among the files.	1,530 bytes	2.5 billion, or limited by disk space.	100 billion, or limited by disk space.	1,500 bytes	Field-by-field and total reprompting
99	2,000 bytes	Limited by disk space.	Limited by disk space.	78 bytes	Total reprompting
Not limited by program.	Limited by disk space.	Limited by disk space.	Limited by disk space.	40 bytes	Does character-by-character appropriateness checking.
Not limited by program.	32,000 bytes	Limited by disk space.	Limited by disk space.	9,999 bytes	Field-by-field
99	2,400 bytes	32,767	Limited by disk space.	70 bytes	Field-by-field and total reprompting
2,048	32,000 bytes	32,000	Only files exist, no encompassing database.	2,000 bytes	Field-by-field is automatic; total and selective reprompting require programming.

Data Types and Maximum Sizes

Character	Numeric				Date
	Integer	Floating point	Money or dollars	Other numeric	
120	Numeric is distinguished from alphanumeric only on calculated fields.	Yes, but not a default. Must be specified.	Not automatic	Aligns decimal point when defining field.	Not automatic
60	60 digits, including minus sign and decimal point; 4 decimal places.	No	60 characters, including dollar sign, decimal point and commas; 2 decimal places.	Up to 4 decimal places in fixed point.	Can be specified system wide as DD/MM/YY or MM/YY/DD format, and will be correctly sorted and ranged as YY/MM/DD.
78	12 digits	No	15 digits	No	8 places
1,500	Range: ± 999,999,999	Range: ± 10^{38} with 6 to 7 place accuracy.	Range: ± 99,999,999,999,999.99	Fractions	Accepts several formats.
76	76 digits	No	No	No	Will include creation date and update date.
40	40 digits, treated same as character.	13 digits	Yes	No	Yes
9,999	9,999 digits	No	9,999 digits	Numeric accuracy to 14 digits	Accepts several formats.
70	± 32,768	No	Plus or minus 9.99999×10^{36}.	No	MM/DD/YY and DD/MM/YY
2,000	22 digits	No	Same as integer	No	Yes

Types/Sizes (cont'd)		Demo Version			Data Importing
Time	Logical	Available?	Cost	Limitations	
Not automatic	Not a default, but user definable.	To dealers only	—	—	Standard: All-purpose sorting program, FORMSORT, imports, sorts and indexes a DIF or SDF file
No	No	No	—	—	SEQ
No	No	Yes	$85	Limited to 30 records.	Word processing files and non-delimited, zero-space-packed ASCII.
HH/MM/SS	No	Yes	$9.95 + shipping	Limited to two 40-record databases.	Special format *Multiplan, Visicalc,* Lotus *1-2-3, dBASE II,* and word processing packages such as *WordStar, MailMerge*
Will include creation time and update time.	No	In development	—	—	SDF only with supporting *dBASE II* files, creates screen format at same time
No	No	No	—	—	DIF, 7 different ASCII styles.
No	No	Yes	$30	Limited to 15 records on output.	SDF, DIF, and comma-delimited ASCII
No	No	To dealers only	—	Not learning device, only for demonstration of most routines.	DIF, Lotus *1-2-3, VisiCalc, Supercalc, Multiplan*
No	No	No	—	—	BASIC sequential file format

Copyrighted material

Data Exporting	Advanced Features				
	Back-up-Ability/ Copy Protection	Audit Trails		Data Restructuring	
		Pre/post imaging	Activity or transaction log	Technique (inherent/ separate program)	Adding or changing indexes
Yes	Not copy protected	No	Yes	Inherent, with FORMSORT.	Yes
SEQ, DIF, word processing interface for exporting data to *Magic Wand, WordPlus-PC, WordPerfect, Select, WordStar*	No automatic backup Files should be copied from inside TIM, but backing up can also be done from DOS with a small penalty	No	Yes	Must specify individual field names, even if identical	Yes, simple to do.
Nondelimited, zero-space-packed ASCII	Not copy protected	No	No	Separate module	Not without destruction of data.
Standard: To other *R BASE* systems or to mainframe *RIM* systems. Special format same as importing.	Not copy protected	No	Yes	The files may be restructured or combined through the use of several inherent techniques.	Easy to do
Converts files to an ASCII format for loading and unloading into *dBASE II* or other programs	Automatic backup during data file reorganization Limited error recovery	No	No	Inherent	Not applicable All sorts done on demand
DIF and 7 ASCII styles	Does backup and restore of special data and catalog files	No	No	Inherent, can add or delete fields at will	Limited
DIF and comma-delimited ASCII	Not copy protected	No	No	Inherent, through SQL language.	Yes, through SQL language and update utility
DIF and to other IT software.	Not copy protected	No	No	Inherent	Easy but slow
BASIC sequential file format	Not copy protected	No	No	Separate, must write application to create new database.	Secondary indexes available.

Adv. Features (cont'd)		Report Generation			
		Capabilities			
Linked or Multiple Update of Indexes and Files	High-level Language &/or Product Interface	Sorting	Aggregates (min, max, count, avg, percent, etc.)	Arithmetic (#, /, +, −)	Parameter passing
No, will not update more than one file at once.	*WordStar, CalcStar, PlanStar,* and *StarBurst.*	Up to 25 separate keys	Yes	Arithmetic and exponentiation	Yes. Maximum number of variables per report is 240.
Yes, can calculate new fields from existing fields.	No	Through indexes, each one of which can have up to 16 sort fields.	Total and average for each break of key field.	No	Yes, report headings and comparison values.
Yes, linked and global updates.	Links to Pascal program *Genie*	Up to 192 key fields; key fields can be concatenated fields.	Yes	Arithmetic and statistical functions	Yes
Yes, can specify a value or an algorithm to use for updating.	An optional programming interface is available from Microrim by separate purchase.	Yes, during queries, updates, and report printing, on up to 10 sort fields.	Aggregates; also will list numbers of occurrences of a particular value in a specified field.	Arithmetic, and date and time calculations.	Temporary variables may be defined for computing totals, subtotals, averages, and percentages of field values.
Yes, through calculation options.	Yes, *dBASE II.*	Up to 5 sort keys	Does counts	Yes	No
Yes	No	Up to 9 sort fields in free-form area and 9 more in columnar area.	No	Arithmetic and exponentiation	No
Yes, through SQL.	C language interface	Up to 5 sort fields	Yes	Yes	Yes, both internally and to C and assembler language programs.
Can update one file from a different file, but not all files at once.	See data importing and exporting.	Up to 9 sort fields	Yes	Arithmetic, standard deviation, and date calculation.	Can concatenate alphanumeric data from selected fields.
Yes	Canned applications planned	Up to 2 fields	Requires programming.	Yes	Range specification for any field

		Query Language			
Flexibility of output	**Multifile access**	**Mass additions, deletions & updates**	**Load and unload**	**Execute stored scripts**	**Quality of output**
Can end a page or report at time specified. Cannot send report to screen.	Yes, up to 16 files at once.	Yes, with batch mode.	Yes	No, but can with addition of MicroPro's *StarBurst*.	Good
Can specify column width and left margin only.	Yes, 2 files can be linked for reporting.	Yes	Yes	Yes	Good
Excellent, can display results in vertical bar charts, absolute numbers, or percentages.	Yes	Yes	Yes	Yes	All functions can be filtered through the criteria established by the query editor.
Very flexible; report formats are "painted."	Yes, via relational operations.	Not possible in report writer.	No	Yes, includes ability to nest command files up to 5 deep.	Excellent
Yes, labels and reports. Destination may be any combination of printer, screen, and disk file.	No	Yes	No	No	Fair
Has free form area for text or placement of fields.	Yes, via relational operations.	No	No	No	Good. Allows wide range of report options and does form letters.
Reports can be fully defined through SQL statements.	Yes, via relational operations.	Yes	Yes	Yes, multiple SQL commands can be stored.	Good. May use same report format for different files.
You can specify many aspects of report format.	Yes, from two files concurrently.	Yes	No	Yes	Good
Limited flexibility since table-driven.	Yes	No, but can be done with a BASIC program	No, but easily done with a BASIC program	No, all "programs" are table-driven.	Good quality

Report Generation (cont'd)					Procedural Language
Query (cont'd) Other	Report Formatter/ Generator	Screen Dumps	Other	Built-in Applications or Examples	
Up to 9 control breaks allowed.	Quick Report feature gives you preformatted report. Custom formatted report allows printing features such as boldface and underlining.	Yes	No	Quick Report	No
No	Limited; cannot use *TIM*'s multifile capabilities.	No	"Quick Print" dump of records.	Yes	No
Excellent print-formatting ability	Yes; report definitions can be saved and recalled.	Yes	Reports can include information from multiple files. Excellent print formatting ability.	Yes, but only as a tutorial.	No
No	Report formats are "painted" and stored for reuse.	No	No	No	No
No	"Painted"	Yes	Memos	5 samples	No
No	Free-form area of report makes it easy to simulate invoices and other forms.	No	No	No	No
Query language is part of SQL.	Part of SQL language	No	No	Example files on diskette and tutorial in manual	No
Up to 7 and/or conditions per select set.	Has custom and default formats.	No	No	No	No
No	Primitive	No	No	Yes	No

Performance Measurements

Time to Enter Standard Info	Time to Execute Standard Task	Time to Perform Sort	Time to Extract Random Records	Size of Database Created	
				Number of records in employee file	Space compression
2 minutes, 37 seconds	4 minutes, 52 seconds	2 minutes, 19 seconds for 1 key sort.	80 seconds on average	500 records=39,680 bytes.	No
Limited by typing speed.	Under 4 seconds	2 minutes, 23 seconds for sort on 2 fields.	Less than 4 seconds	500 records=58,368 bytes.	Upon request
15 minutes	11 minutes	6 minutes	20 seconds	500 records	No
4 minutes, 56 seconds	9 minutes, 19 seconds.	2 minutes, 38 seconds	13 seconds	500 records=59,904 bytes.	No, but can rewrite database to clean it up.
25 minutes	5 minutes	29 seconds for 25-record, 2-field deep sort.	2 seconds	25 records=3,328 bytes.	No
20 minutes	Currently has no provision for queries; must use series of screens.	15 minutes; sort is part of custom report process.	No direct query method in current release.	500 records=72,000 bytes.	Yes
30 seconds	10 seconds	1 minute, 35 seconds	3 seconds on average	506 records=20,910 bytes.	No
1 minute, 5 seconds	6 minutes, 7 seconds.	1 minute, 11 seconds for 2-level sort	9 seconds	500 records=51,584 bytes	Yes
Limited by typing speed.	15 minutes; requires 5 passes through database.	20 minutes for 500 records.	3 seconds on average	25 records=2,652 bytes	No

Performance Measurements (cont'd)					Hardware/
Size (cont'd) Variable length of fields	Number & Size of Ancillary Files	Degradation with Additional Indexes	Time to Create a Standard Report to Screen	Time to Execute a Standard Report to Screen	Minimum Configuration Required
Yes	File definition file=1,920 bytes; Index=10,496 bytes.	Some degradation noted.	20 minutes	5 minutes, 31 seconds	96K, 1 drive, DOS 1.1
No	1 index file per index field, with 2 bytes per record.	Negligible	10 minutes	4 minutes, 20 seconds	128K, 2 drives, DOS 1.1
Yes	5 files, ranging in length from 512 to 57,856 bytes.	None detectable	5 minutes	8 minutes	128K for DOS 1.1, 192K for DOS 2.0, 2 drives.
No	Index file=8,704 bytes; data dictionary=9,600 bytes.	Some degradation noted.	3 minutes	Physical join=1 minute and execution=1 minute, for total of 2 minutes.	256K, 2 drives, DOS 1.1
No	Screen=4,736 bytes; report format=896 bytes; other=256 bytes.	—	1 minute, 30 seconds	14 minutes	64K, 1 drive, DOS 1.1
Yes	Has main file only.	Basically one index in traditional sense, but interrelated screen structure can simulate infinite number of keys.	Only a few minutes, once style is learned.	15 minutes	192K, 1 drive, DOS 2.0
Yes	Many ancillary files. Group 2 tasks and the *10 Base* program occupied all of 2 double-sided diskettes.	None detectable	1 minute	Under 1 minute	192K, 2 drives, DOS 2.0
No	Index=16,896 bytes; definition file=1,280 bytes; 4 others=128 bytes each.	Some degradation noted.	3 minutes	15 minutes	128K for DOS 1.x, 92K for DOS 2.x, 2 drives.
No	Has main files only.	No	15 minutes	5 minutes	128K, 1 drive, DOS 2.0

Software	Subjective Evaluations				
Configuration Used in Testing	Documentation	Program Robustness	Flexibility/Ease of Use	Would You Buy This One?	Would You Accept It as a Gift?
128K, 2 drives, DOS 2.0	Excellent	Very robust	Not easy to use, but extremely flexible. Same cursor manipulation as in *WordStar*.	No, too much input required. Few default operational setups required.	No
320K, 2 drives, DOS 2.0.	Good, gives information about file structure and a set of BASIC subroutines that assist in importing.	No problems in evidence	Good; many options for this type of product.	Would certainly consider it, though limited report formatting bothers me.	Yes
512K with Quadram quad disk, DOS 2.0	Extensive but uneven	The program sometimes quits if it receives a DOS message it doesn't like.	Flexible on a sophisticated level; would take a long time to know well.	Not this one; too limited.	No
256K, 2 drives, DOS 2.0.	Superb	Excellent	Easy to use and very flexible.	Yes, despite tremendous requirements of disk storage for operations.	Yes
192K, 2 drives, DOS 2.0.	Weak; poorly organized and presented, not clearly written.	Care is needed in some areas to avoid errors.	Extremely flexible, but not always easy to use.	Possibly; it has an excellent range of features.	Yes, certain features make it handy for some applications.
640K, 2 drives, DOS 2.0.	Fair to good. Nicely typeset, tabs, easel-type binder. Instructions are detailed, but no index.	Appears solid.	Excellent, but system is not really complete.	Will be a very good choice for beginner to intermediate users once system is completed by addition of Query and other features.	No, I still prefer *dBASE II* for flexibility and programmability.
512K, Quadram quad disk, DOS 2.0.	Excellent; contains illustrations, index, and tutorial.	Excellent. Well protected against errors, but may try to complete improperly described sorts.	The IBM SQL commands must be used for all significant actions. Experience and practice are needed to take full advantage of the language.	Yes, for files totaling over 400K.	Yes
128K, 2 drives, DOS 2.0.	Very good	Fair	Extremely easy to use; rather flexible. Can be used easily with many software products.	No, but I would if I were a businessman.	Yes, for business use.
256K, 2 drives, DOS 1.1.	Needs to be greatly clarified. Company promises improvements by release date.	Poor. The program often returns cursor to beginning of field without giving error message or beep.	Easy to use, *not* easy to learn.	No	No

PROJECT DATA BASE

PC-FILE 'N REPORT: A Diamond in the Rough



Data for one employee as seen in *PC-FILE 'N REPORT*.

PC FILE 'N REPORT is a young product that has many attractive features and shows signs of rapidly maturing into a solid and useful program. Released just last December, it has already been revised twice, with a third revision in the works.

Filing and reporting with *PC FILE 'N REPORT* begin with the creation of a data entry screen, which you design by "painting" the screen with fields. During this process, you have full-screen editing control and may use the cursor control keys and the Ins, Del, and Tab keys. One small quirk of the data entry screen is that the field titles must be attached by an unbroken string of characters to the brackets that define the field space. The manual suggests that you use periods. Although the periods appear on the data entry screen, they do not show up in printed reports. The three types of general fields are: alphabetic (A–Z only), alphanumeric, and numeric (0–9 only). For numeric data that display a decimal point or a minus sign, you must define the fields as alphanumeric, or *PC FILE 'N REPORT* will not accept the punctuation characters. There are four special field definitions that automatically stamp a record with the time and date of its creation or its last update.

The data entry procedure is generally smooth, once you get used to certain details. The cursor moves from field to field, advancing either when you press the Enter key or type a character in the last position in a field (such as the fifth digit in a ZIP code). The automatic movement of the cursor to the next field improves the speed of data entry by eliminating a keystroke, but you sacrifice the chance to edit what you have just typed. *PC FILE 'N REPORT* encourages high-speed data entry by "beeping" each time the cursor advances to the next field. The sound allows you to keep your eyes on the source documents, while you follow the progress on the screen with your ears. At first, I found the constant beeping to be annoying, but by the end of a short data entry session, the sound prompt proved helpful. (In the next release, the publisher is planning to give the user the option of turning this feature on and off.) In any case, the beep is distinctively different from an error message signal, and I quickly learned to tell the difference.

Another important aspect of data entry is that you must press the F1 key to record new records. If you fail to do so and continue typing away, you will write over the data that you entered for the previous record. As a result, you may end up not storing records you think you have entered. To help you avoid this situation, the data entry screen displays the total number of records in the file, making it

Filing and reporting with PC FILE 'N REPORT begin with the creation of a data entry screen, which you design by "painting" the screen with fields.

JASPIR International, Inc.
24 Salrit Ave.
Waldwick, NJ 07463
(201) 445-8535
List Price: $195
Description: Relational
Requires: 64K RAM, 1 disk drive, DOS 1.1.
Records per File: Limited by disk space.

CIRCLE 672 ON READER SERVICE CARD



possible to calculate the number of records actually added as compared to the number you meant to add.

One of the most powerful features of *PC FILE 'N REPORT* is its ability to perform table lookups during data entry. This feature gives it much of the power available in a more complex, hierarchical database management system. Apparently, it is possible to set up reference files not only to perform data entry verification but also to provide data for constructing records. You can, for instance, set up a system that requires you to enter only a customer's ZIP code and package weight. The program then checks the ZIP code against a table file to find the appropriate shipping zone, takes the package weight to another table file to find the appropriate shipping rate, brings this value back to the record, and uses it to compute the shipping costs automatically. In a few easy steps, you can have a total invoice cost, simply by providing the ZIP code and the package weight. In this same example, if you didn't know a customer's ZIP code, the system could access it through a customer number table file, which might also include the customer's name and address. This table lookup feature is extremely sophisticated and provides much of *PC FILE 'N REPORT*'s potential power.

Label Formats

The program's reporting capabilities go well beyond standard report formats. *PC FILE 'N REPORT* can also create complex "label" formats, which can be used not only for mailing labels and rotary file cards, but also, apparently, to perform calculations and full-page formatting. The manual includes samples of an invoice, a purchase order, and a billing statement, all of which were produced using label formats. The program even includes a simple text editor. You can create "memo files," which can be accessed in a variety of ways. But although one memo page can call another during the printing process, there does not appear to be any way to merge memos with database records to create form letters.

PC FILE 'N REPORT allows you to import data from *dBASE II* files. The process can also be reversed. In either case, conversions require both *PC FILE 'N REPORT* and *dBASE II* programs.

Reports may be sent to any combination of printer, screen, and disk file. Indeed, you can create ASCII files of the data for use with other programs. You also have many options for reorganizing your data files and for copying data from one file to another within *PC FILE 'N REPORT*. As a result, you are unlikely to ever get "caught" with your data in a format that no longer meets your needs.

Where the Problems Are

The biggest problem with *PC FILE 'N REPORT* is the user's manual. It has the unmistakable feel of programmer's prose, as it methodically marches through each menu item. There is a skimpy table of contents and no index; pages are typed—not typeset. The text is relieved by few graphic elements, and there are no tabbed dividers to aid in finding reference material quickly. The sample files provided on disk lack a tutorial to aid new users. The numerous screen prints, which should make learning easier, in fact create confusion because they come from more than one version of the program. (The publisher is working to revise the manual with the help of professional writers.)

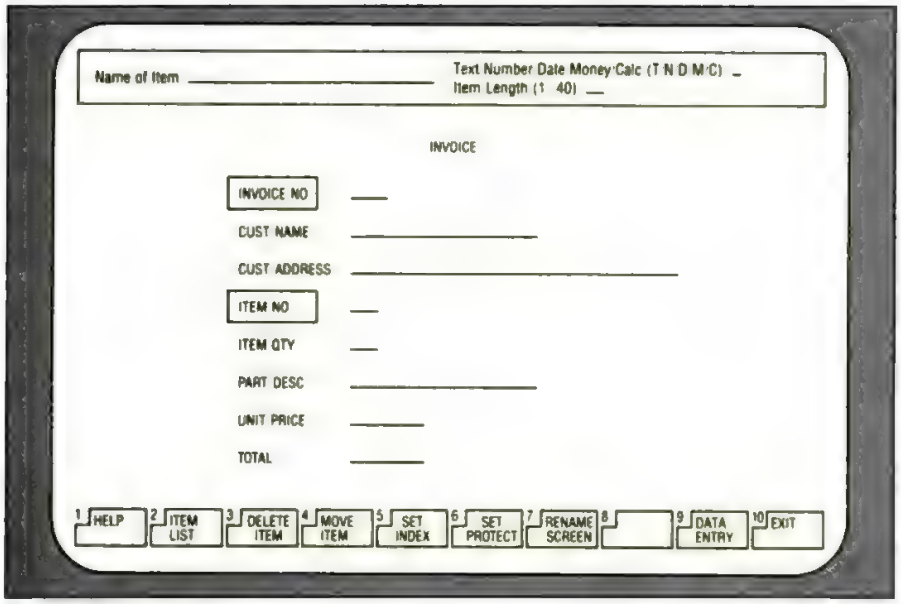
The program's remaining flaws are comparatively slight. Most menus are a bit cluttered with options, and some of the command prompts and messages have a cryptic ring to them. The Function keys could have been put to more use to eliminate some of the details that the operator must now remember, especially in the data entry mode. In some instances, the program is not "case sensitive" (which means it doesn't care if you respond with A or a), but in most situations it is. These problems may be addressed in the revision currently in process.

In the final analysis, *PC FILE 'N REPORT* is a diamond in the rough. Many programs costing two to three times as much cannot do most of what *PC FILE 'N REPORT* can. Although it is still a bit difficult to work with, if you are willing to invest the time to learn how to make it perform for you, you should be well rewarded.

—Alfred Poor

PROJECT DATA BASE

ASAP FIVE: A Work in Progress



In *ASAP FIVE*, the data entry screen can be designed; index fields (invoice and item numbers) are boxed.

ASAP FIVE is a simple and easy-to-use database management system with excellent human engineering and surprisingly sophisticated design features, but it has some omissions.

The program uses the relational model of data management, which has become popular in recent years for several good reasons, including ease of use, straightforward conceptualization of the data structure, and simplicity. Unlike some other Category 2 products, *ASAP FIVE* is a truly relational program rather than a simple file management system. It can also perform sophisticated relational tricks, such as forming virtual relations on the fly, that even some far more expensive programs can't manage.

ASAP FIVE maintains a complete Data Dictionary, another desirable feature that other relational products often do not incorporate. The system also maintains internal directories of data files, screen designs, and report layouts. These elements can have up to 20-character names, neatly circumventing the file-naming restrictions imposed by DOS.

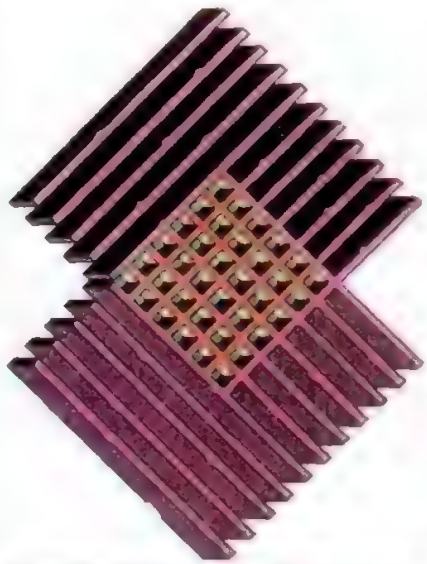
Most low-end and intermediate database managers are quite restrictive in the limitations they impose on the number of fields, files, and screens you can use; how many files can be open for reports; and the maximum size of a database. *ASAP FIVE* is unmatched in its ability to design and manage databases that are restricted only by available disk space. In fact, *ASAP FIVE* imposes *no* limits on the number of files in a database, how many fields a database can have, how big each record can be, how many records a file can contain or how many records a database can contain. This is truly exceptional, especially in a database obviously designed for the beginning to intermediate user.

ASAP FIVE is menu-driven; its command options are chosen from an unusually attractive sequence of menus. You cannot bypass the menu structure to issue direct commands. *ASAP FIVE* uses the ANSI.SYS driver for cursor control, so the system will only work with DOS 2.0 or higher. A side benefit of DOS 2.0 is the ability to have up to 99 files open simultaneously and to set up 20 disk buffers for improved performance, but DOS 1.1 users are out of luck.

Designer Screens

As with all database managers, the first step in using *ASAP FIVE* is designing the structure of the data files. You give each field a name of up to 20 characters (with embedded spaces allowed) and choose the type of data the field is to contain and how long it will be. Available data types include text (up to 40 characters), numeric (real with up to 13 digits), money, date, and calculated (a field generated by arithmetic manipulation of other fields).

The program places each field on the entry screen. The first few fields are dou-



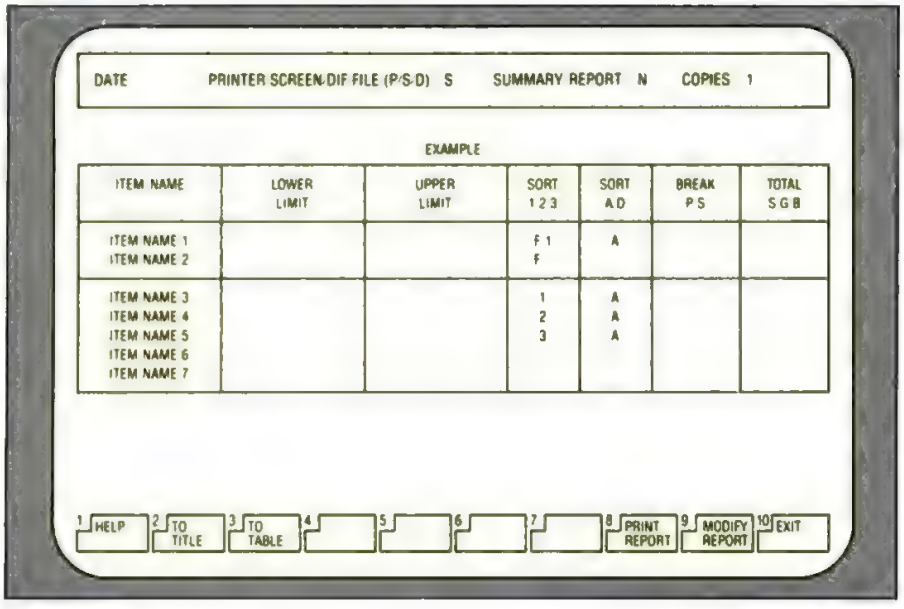
ASAP Systems, Inc.
2425 Porter St. #14
Soquel, CA 95073
(800) 345-2727
List Price: $395
Description: Relational
Requires: 192K RAM, 1 disk drive, DOS 2.0.
Records per File: Limited by disk space.

CIRCLE 673 ON READER SERVICE CARD

The Dilemma.

So now I have this computer in my office with word processing. But how do I get my computer to solve my OTHER business problems? Like sending out personalized form letters to the right people? Keeping track of my sales prospects and their potential? Reporting on inventory? Automating my billing system? How do I do all that? By myself? Right NOW? THERE'S GOTTA BE SOMETHING!!!





***ASAP FIVE*'s custom report function allows specification of ranges, sort fields, page breaks and totals.**

ble-spaced, but as the screen fills up they become single-spaced. If you enter even more fields, *ASAP FIVE* splits the screen vertically to make room on the display. A maximum of 40 fields can fit on one screen, but multiple screens can be designed to handle still more. You can move or delete fields with function keys.

The first field on the screen is automatically designated as an index, and you can specify two more fields as index fields. *ASAP FIVE*'s concept of an index is unique in that the three index fields are not truly separate indexes: They are more accurately viewed as one concatenated multiple index. Indexing in *ASAP FIVE* is actually much more sophisticated than mere field indexes, so this is not really a limitation. You can protect fields so that their contents cannot be changed during any subsequent editing function.

ASAP FIVE maintains all previously entered fields in its Data Dictionary, so the system knows about fields entered on other screens. If you enter a matching field name during screen creation, the system automatically fills in the field type and length. This is the first indication that anything special is happening in *ASAP FIVE*. The system design allows an almost infinite interlocking structure of display screens, each of which can update any other screen. Such "virtual relations" can result in extremely sophisticated multi-indexed data structures. A minor drawback is that it is not possible to use field names that have previously been defined for other purposes (for example, the field name CITY can't be used in different files with different lengths). This could get a bit sticky if a disk is to hold more than one database, but the power of the concept more than compensates for this inconvenience. Just keep separate disks for unrelated projects.

ASAP FIVE is a simple database management system with excellent human engineering and surprisingly sophisticated design features.

ASAP FIVE's Data Entry option is used both for data entry and editing existing data. Entering data is straightforward, with one nice touch: The contents of a field in the previously entered record is available at the touch of a function key, making entry of many records in a given state, for example, much easier. When you use the screen for editing, the previous and next records are available based on the contents of the first key field or one of the other two possible keys.

Unfortunately, *ASAP FIVE* has no query language or its equivalent. You cannot ask for a specific employee number or last name or make any ad hoc inquiry. This is a major omission. For one thing, it means you can't correct an error in an individual record without slowly approaching it one record at a time. A beta version of *ASAP FIVE* that I examined in addition to the current release showed a query option that was not implemented. However, by the time you read this article, a query module may be available.

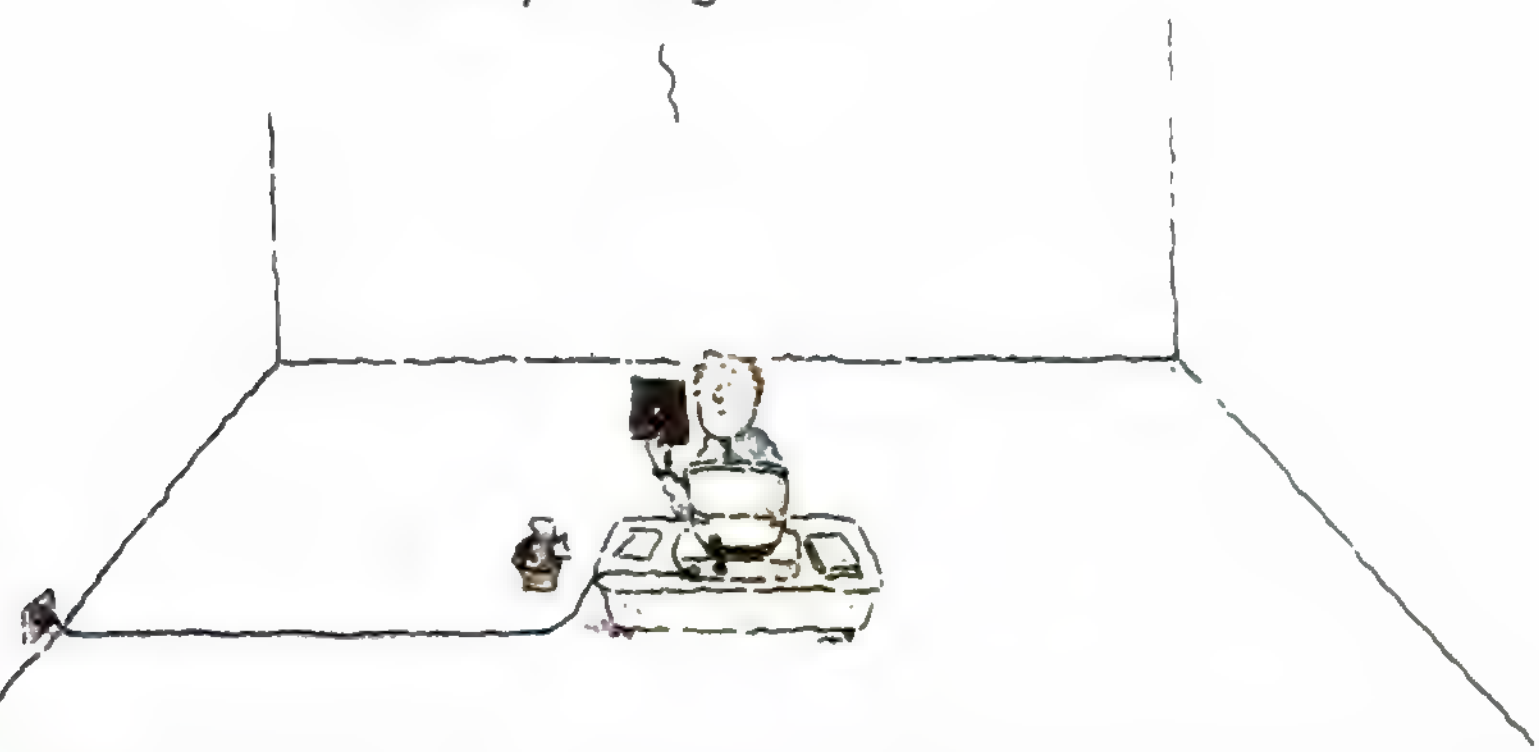
A complex structure of interconnected screens could simulate or even be more powerful than a simple query module, and a sophisticated user can build some very impressive data manipulation designs. But this is probably beyond the capabilities of the less-experienced users who are the most natural target prospects for *ASAP FIVE*.

Quick and Custom

Things look up again when you move on to *ASAP FIVE*'s report generation facilities. Two main report options are provided: Quick Reports and Custom Reports. A Quick Report can display or print up to 39 fields associated with one data screen in a standard 8½-by-11-inch format. *ASAP FIVE* automatically formats a reasonably attractive columnar report. Each record will take as many lines as necessary; fields are not split. The report can be displayed

The Discovery.

InfoStar +, from MicroPro.
They say it'll solve all my
problems --easily.
Well, here goes...





More and more people in business are facing the same dilemma. And making the same discovery.

The dilemma is what software program will make that fancy new business computer perform all those useful business functions you were told it could perform when you bought it.

The discovery is InfoStar+ from MicroPro.

InfoStar+ allows you to turn your computer into an advanced information processor (the same way our best-selling WordStar® turns your computer into an advanced word processor).

With InfoStar+, you can sort your mailing lists, automate your billing system, organize and report your inventory—turn your mass of forms and paperwork into useful data.

You choose the information. InfoStar+ will sort and report it. Quickly and accurately. And all without the need of an expensive outside consultant to set it up, "program" it, or teach you or your employees how to use it.

The results? Just turn the page...

INFOSTAR™+ MicroPro.

© 1984 MicroPro® International Corp.

on the screen, printed, or converted to a standard DIF format file on disk.

ASAP FIVE's real reporting flexibility is in the Custom Report module. Creating a Custom Report is a two-step process. First you define the fields to be included and how you want to position them. *ASAP FIVE* sets up a one-line header with a date, title, and page number, a free-form area in which any text or field contents can be placed, and a normal columnar area for a table of output.

The free-form area is the star of the show. You use the cursor movement and editing keys to enter text or to position fields, which allows text to be entered in a primitive form of word processing—albeit without word wrap or other normal word processing features. *ASAP FIVE* can thus create custom form letters much like *MailMerge*. The free-form area is also terrific for creating forms such as invoices and other block designs or lengthy text headers for columnar reports.

The column area allows you to specify fields in any order but does not permit you to specify what column a field should start in. *ASAP FIVE* spreads the columns well, but more user control would be nice. In addition, you can move or delete fields; specify standard 8½-by-11-inch wide 132-column, or compressed wide reports; and insert or delete lines for neater formatting.

Once you have made these decisions, the second phase of the Custom Report definition process begins. A nicely formatted table appears that allows you to specify a wide range of report options. The report date, destination (screen, printer, or DIF file), report title, and number of copies you desire are input on one line. The table itself lists all the fields specified earlier. You can specify a lower limit and upper limit for each field; if both limits are the same, only records matching the given value will be included in the report. You can mark up to nine fields as sort keys in either ascending or descending order. A field can be marked as a Break field for a blank line or page eject, meaning that the specified action will take place when the value of the field changes. You can also request subtotals, grand totals, or both for any field. You choose these options by moving the cursor keys; the process is easy and straightforward.

Once you've made these choices, the report is generated. *ASAP FIVE* can take a while to begin its output (my sample report did not begin printing for 15 minutes). The pace is not due to sorting delays, as you might think; I tried the sample report with both two and three sort keys and the initial delay was identical. The delay occurs because *ASAP FIVE* formats the entire report before it begins printing, performing record extraction and other functions as it goes along.

ASAP FIVE maintains all previously entered fields in its Data Dictionary, so the system knows about fields entered on other screens.

In any event, the Custom Reports work exactly as expected. The ability to create form letters is most unusual in a database manager, and it works well.

Other Goodies

A special module can print mailing labels. The newest release of *ASAP FIVE* allows adjustments to handle labels of various sizes. The program handles only one-up labels and has no provisions for multiple two-, three-, or four-across labels. This is unfortunate, since multiple labels are easier to print and more reliable than one-ups.

The final *ASAP FIVE* modules handle backup and restoring of *ASAP* files. The system uses DOS' facilities in this area and works fine.

As I mentioned, *ASAP FIVE* can create DIF files from both its Quick and Custom Report modules. The current release can also import data stored in DIF format from programs like *1-2-3* and *VisiCalc*. The beta version included the most flexible import/export provisions I have seen. In addition to DIF files, the new version could import or export in any of seven ASCII formats, including BASIC, COBOL, *MailMerge*, and other fixed-position and comma-delimited styles. The ones I tried were easy to use and worked well, although they were slower than DIF file translation.

ASAP is one of the few software houses I know that maintains a toll-free number for user questions and support. The support staff is knowledgeable and patient.

The documentation is reasonably good as well. It is attractively typeset with a good set of tabs, and the easel-type binder is excellent. The text itself is on the terse side, however, and there should be more examples and tutorial material in a manual targeted to beginners.

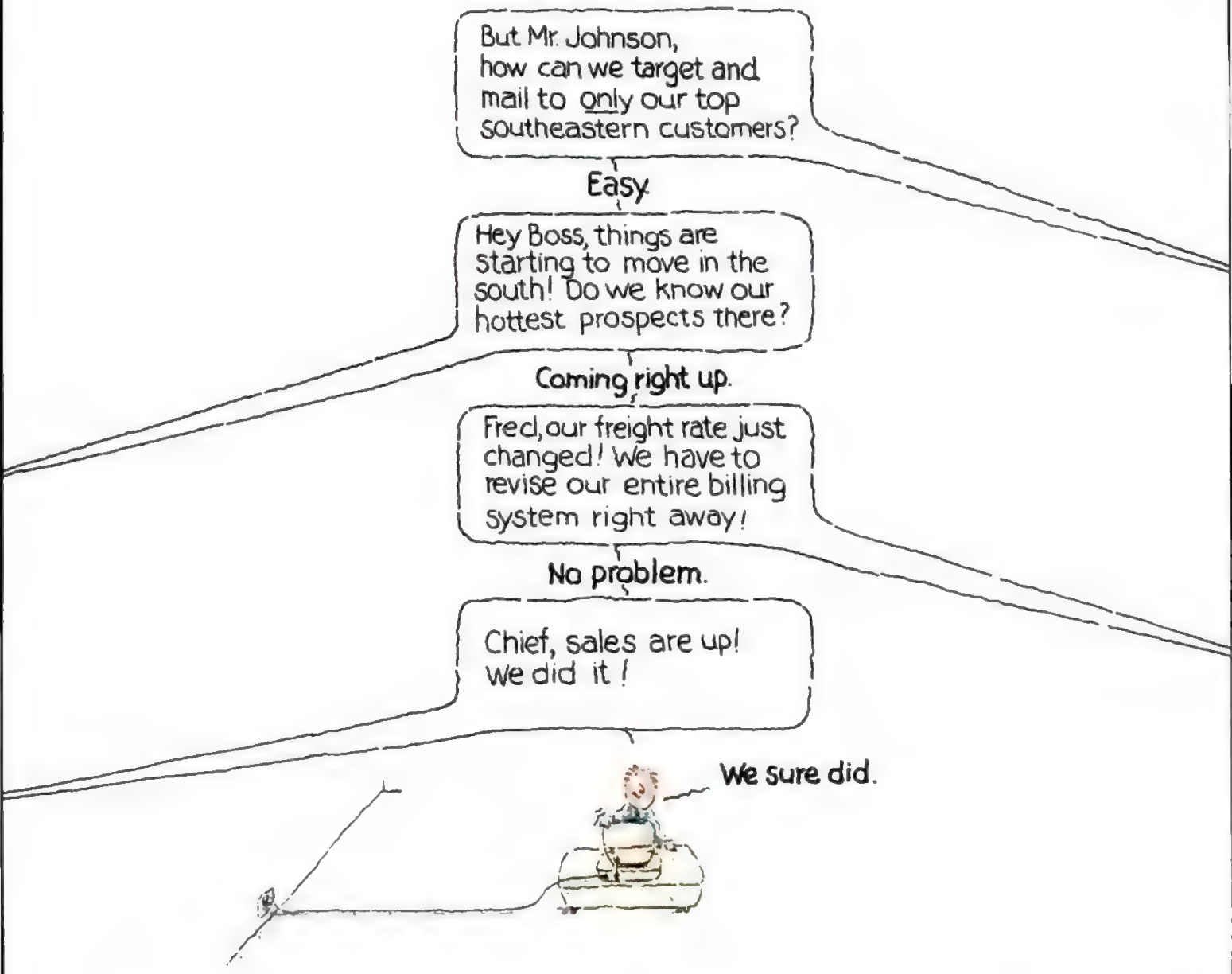
ASAP FIVE is an elegant system to look at and to use. The virtual relation capability is quite unusual for a product in this class, and it's easy to use.

The lack of a query module is a significant weakness that should be corrected soon. The program is reasonably fast, considering it is written in C rather than assembly language, but there is quite a bit of code in the total system. *ASAP FIVE* runs well on floppies, but like most database managers it is much happier on a hard disk.

I am tempted to think of *ASAP FIVE* as a "work in progress." While I don't mean to imply that the program is not usable as is, I feel that it may evolve into something quite special in time. *ASAP FIVE* certainly merits serious consideration in its class, but it is also a product to keep your eye on in the future. **—Glenn A. Hart**

(continued)

The Reward.



What makes InfoStar+ superior to other "data management" software is how it accomplishes so much, so easily.

Unlike less ambitious programs, InfoStar+ lets you store more information than you'll probably ever need (literally 10's of thousands of records), with the ability to sort out and organize over 1000 records in about a minute.

And unlike other powerful programs, InfoStar+ is a program you can set up and learn, all by yourself. (Other software may require a computer programmer for set up and instruction.) It comes with MicroPro's exclusive "tutor-in-your-computer,™" eight easy on-screen lessons to get you going fast. Plus you may purchase ProSolutions,™ ready-made applications which cover the most common business needs.

And of course, InfoStar+ works beautifully with WordStar® and other MicroPro software.

To discover the rewards of InfoStar+ for yourself, call (800) 443-0100 ext. 948 and ask for the MicroPro dealer nearest you. So you can move on to your next dilemma: How to handle the increased business.

INFOSTAR™+ MicroPro.

© 1984 MicroPro® International Corp.

For more information, write MicroPro, Dept. B, 33 San Pablo Ave., San Rafael, CA 94903.

CIRCLE 231 ON READER SERVICE CARD

PROJECT DATA BASE

10 BASE: Flexible Power



A *10 BASE* report, displaying department names from the department file and alphabetized by employee last names.

If you list the positive and negative features of the *10 BASE* database management system, the positive list is quite long and the negative list is quite short. But the two lists have one major item in common. The good news about *10 BASE* is that it is completely based on the IBM SQL database management programming language—that's also the bad news.

SQL is a well-defined, higher-order language designed especially for DBMS work. Its most common use is on IBM mainframe computer systems. In the *10 BASE* version, it has only 11 commands to remember; and the construction of these commands is very simple compared to many other languages. The commands are all English statements, which include SELECT, ASSIGN, INSERT, DELETE, UPDATE, FORMAT, CREATE, MODIFY, DROP, and REORGANIZE. The commands make sense, and they are easy to link together with auxiliary words such as INTO, WHERE, and ON. When you create a database with SQL (pronounced "see-kwul" by insiders), you have great flexibility and power.

The program makes good use of the PC's keyboard—all of the cursor and editing keys are available to help you enter and edit SQL statements. The special-function keys are used for several useful purposes, and their assigned functions remain the same no matter where you are in the program.

But when you start to create a database with SQL, you are faced with the most intimidating situation in the world of man/machine relations: a blinking cursor and a blank screen. You are expected to know where to start. This blank screen stares at you many times when you use *10 BASE*, so if you aren't the type who likes to press ahead, you might be better off with some kind of menu-driven system. If, however, you see a blank screen as an opportunity to design things the way you want them, then *10 BASE* has the power to let you grow.

The growth potential of *10 BASE* is an important part of the program. Its distributor, Fox Research, Inc., has integrated *10 BASE* with a local area network for the PC called *10 NET* that makes the program into a true multi-user database system. The local area network system also adds security features that the single-user version of *10 BASE* lacks.

Another advantage of *10 BASE* is that it allows you to start small. The program costs only $495, which, considering its power, is an excellent price. You can quickly learn to write simple requests for information using SQL. A statement such as SELECT CHECKNUM, CHECKAMT, PAYEE FROM CHECKREG PRINT. will print a report showing the number, amount, and payee of all checks in a file called CHECKREG. If you add WHERE MONTH - 04, you will get only the checks written in April. Much more complex relationships can be expressed with only a few more words. The power of *10 BASE* can grow as your needs and mastery of the SQL language grow, but you must be willing and able to write the code to get the results.

10 BASE has very few limitations for the experienced programmer. It has few internal limits, and since you can use up to 16 files of unlimited length simultaneously, you will run out of disk storage space before you exceed the program's capabilities.

Everything in *10 BASE* revolves around the SQL statements. An important program function allows you to save these statements using any name you like and then recall them with the touch of a key. You can re-create reports whenever you

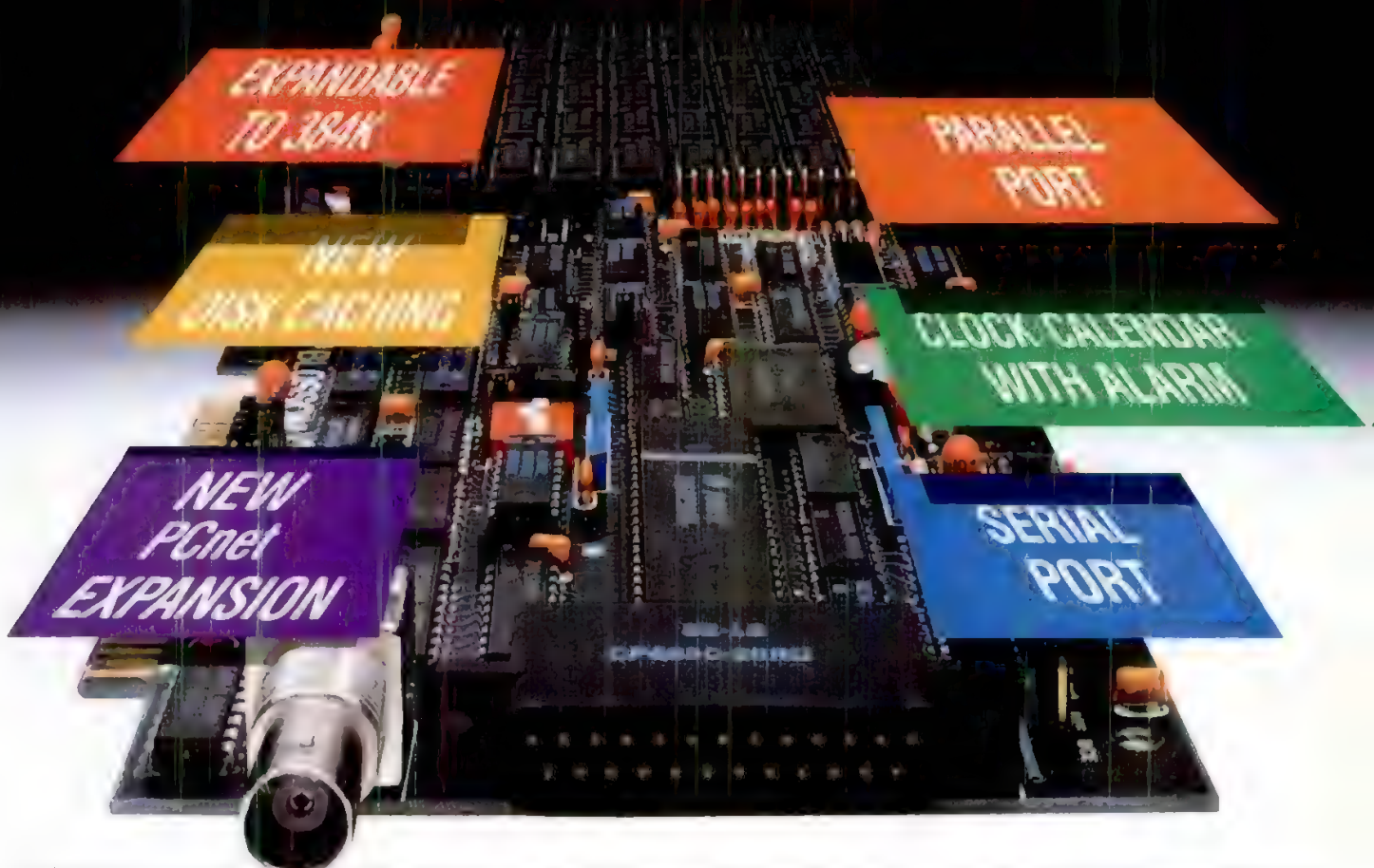
10 BASE
Fox Research, Inc.
7005 Corporate Way
Dayton, OH 45459
(513) 433-2238
List Price: $495
Description: Relational
Requires: 192K RAM, 2 disk drives, DOS 2.0.
Records per File: Limited by disk space.

CIRCLE 674 ON READER SERVICE CARD

BLOSSOM™

The New Generation Multifunction Board

1984 • BLOSSOM • 384K + IO + PCnet™
1983 • SIXPACKPLUS • 384K + IO
1982 • QUADBOARD • 256K + IO
1981 • IBM PC • 64K



BLOSSOM: Out of the confused multifunction world emerges the only board which will let your PC continue to expand beyond current multifunction capabilities and permit it to meet your future needs.

New from Orchid Technology, BLOSSOM uniquely meets the challenge. It has all the standard multifunction features, plus Orchid's advanced productivity software and built-in logic that allows connection to PCnet, a low-cost local area network that has been proven in thousands of installations.



PCnet BLOSSOM™: When your future needs require networking, a simple, optional, plug-in daughter board connects you to PCnet, the leading local area network for the IBM PC and compatibles. Now you'll be able to inexpensively share hard disks, printers, information, etc.

Orchid invites you to buy the BLOSSOM for your multifunction needs today, and its PCnet expansion capabilities for networking tomorrow.

For more information, call Orchid Technology at (415)490-8586.

CIRCLE 123 ON READER SERVICE CARD

ORCHID

ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539
(415)490-8586 Telex: 709289

PCnet, PCnet BLOSSOM and BLOSSOM are trademarks of Orchid Technology. IBM and IBM PC are trademarks of International Business Machines Corporation. SIXPACKPLUS is a trademark of AST Research, Inc. QUADBOARD is a trademark of Quadram Corporation.

need them simply by touching the F8 key, entering the name of the command file, and touching the F1 key. You can repeat many other complex command sequences this way; the function saves you a great deal of time and allows you to build a unique library of prestored command lines that can be called and executed with just a few keystrokes.

Designing the Database

The *10 BASE* manual refers to relational files as tables. The table creation function in *10 BASE* allows you to write SQL commands describing the fields in the table, their length, and three data types: character, numeric, and integer. At some later time, you can specify which fields you want to act as keys and you can change them whenever you like. You can change the field length at any time, but you can't switch the identification of fields between character and numeric. (This limitation is only a problem if you find, for example, that the people who provided the data did something unfortunate like designating the zip code field as character instead of numeric.)

The latest version of *10 BASE* includes a form generation utility that allows you to "paint" the form on the screen along with titles, instructions, and names representing the blanks on the form. You can create forms for either input or output. You can also link the form to specific help screens in the *10 BASE* Help file, so if another user asks for help while using the form, he will see the screen or screens you have designated. This forms creation utility does not, however, automatically link into the data table you have created. You have to write a SQL statement that equates the blanks in the form to the fields of the table. The utility is valuable if you are designing a database system for use by inexperienced people, but it can be ignored if the user can work with a screen that only contains short field names or if you import your data from existing files.

The *10 BASE* package contains a very nice "bridging" utility that allows you to read and create files in the common DIF and comma-delimited ASCII file formats. It is menu driven and very easy to use. It includes error codes that tell you (in general terms) if the files you are importing don't fit into the data table you have created.

The SQL statements used to make inquiries into the database are easy to write once you know the construction to use, but



The good news about 10 BASE is that it is based on SQL—that's also the bad news.

they must be accurate both in syntax and logic. The program checks for proper syntax and will tell you if you made an error, but it will try and work on tasks you write (sometimes endlessly) if the logic is not correct.

During the filling of complex data retrieval requests involving multiple fields in multiple tables, the speed of the program often depends on how you phrase the commands. When I did the standard *PC Magazine* tasks with *10 BASE*, I found it was easy to join the two tables into one and search through the new combined table. An alternative was to write an SQL statement that searched through and compared every field of each table, but the retrieval time for this process would have been many times longer.

The *10 BASE* FORMAT command allows you to create a document with headings, column names, numbers formatted uniformly, and special data categories such as totals and subtotals. Once you create a format, it can be saved under any name you choose and then that name can be included as part of a SELECT command. This useful feature permits you to use the same standard format for reports that may cover many different files.

10 BASE has tables and working areas that can be accessed by programs written in C or assembly language. You can construct and use a special table as an input/output point for another application program. The DBMS and the application program can both read and write to the table and see one another's data. *10 BASE* uses the work area to keep information between calls. It can be read by an applications program, but it should not be modified.

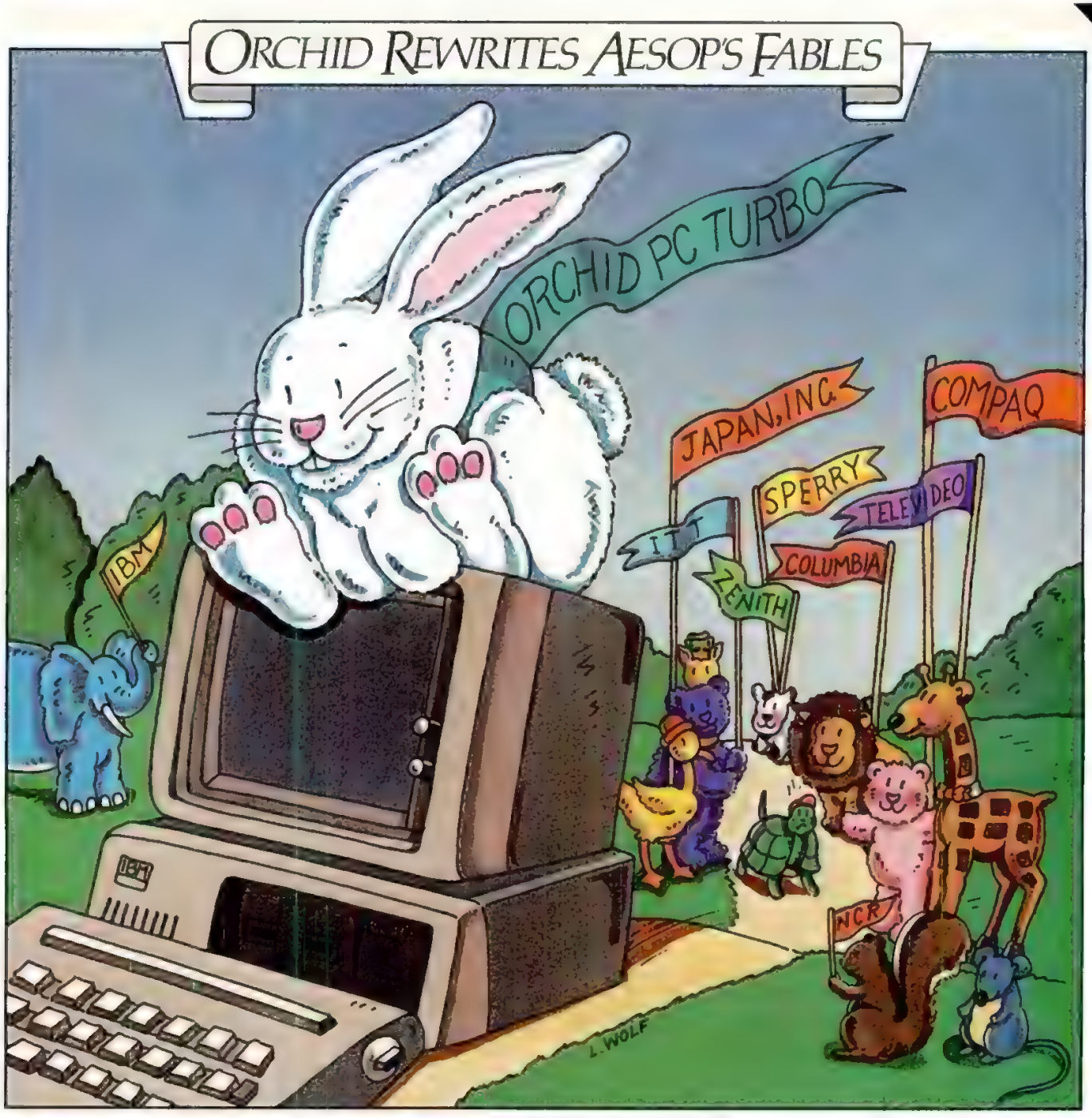
Documentation

The *10 BASE* manual contains a good index and sections including both a detailed description of each command in alphabetical order (like the IBM DOS manual) and more general sections on programming and database design. The manual also includes a tutorial that I found very helpful. A quick reference sheet gives examples of the SQL commands and their use and can take a little of the terror away from that blank screen and blinking cursor.

10 BASE is powerful and well priced. It lacks some of the statistical capabilities of other systems with otherwise equal manipulative power, but if you are more interested in names than numbers it is terrifically flexible. The SQL language can be intimidating at first, but with a little practice it becomes faster and more natural to use than structured menus. *10 BASE*'s potential for growth makes it my choice for large-scale business applications.

—Frank Derfler

(continued)



With PC TURBO...Speed Wins the Race.

In business, success comes to those who win the race against deadlines and competition. The IBM™ PC is a great tool, but valuable time can be wasted waiting for it to recalculate spreadsheets, retrieve data, or execute the newer and more complex software packages. PCturbo,™ new from Orchid, can help you win and enjoy the fruits of success.

PCturbo is the ultimate IBM PC productivity enhancement. It boosts the execution speed of your PC so you can get more done in less time. And it's transparent to existing programs such as WordStar,™ Lotus 1-2-3,™ and dBase II.™ So, with PCturbo, your PC looks and acts the same as before; it just runs faster.

Who needs PCturbo? Anyone who ever waits for their PC to finish executing so they can run something else. Programmers waiting for compilers to finish before testing a new feature. Businessmen waiting for a data base to retrieve account information. Word processors waiting for the spelling checker to finish before printing.

PCturbo does more than just speed up the PC. It extends the life of slower, older programs. It provides a base for new sophisticated software. And it protects your PC investment. You get your work done quicker and decisions made sooner. The very reasons you got a computer in the first place. Write or call for more information.

ORCHID

ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539
(415) 490-8586 Telex: 709289

TECHNICAL DETAILS:

Hardware
- One slot plug-in board with high-speed 16-bit processor (8086 or 80186)
- Up to 640K on-board memory for a maximum of 1.28 Mbytes total PC memory.
- Simple "one step" installation.

Software
- Runs IBM PC-DOS 2.0/1 on either the IBM PC or XT.
- Provides disk caching, RAM disk using available PC memory up to 640 Kbytes.
- Concurrent program execution available soon.

PCturbo is a trademark of Orchid Technology. IBM PC and XT are trademarks of International Business Machines Corporation. WordStar is a trademark of MicroPro. Lotus 1-2-3 is a trademark of Lotus Development Corporation. dBase II is a trademark of Ashton-Tate.

CIRCLE 122 ON READER SERVICE CARD

KeepIT: Friendly and Flexible

Lastnam	Dept:num	Deptnam
Adams	300	Marketing
Adams	400	Production
Adams	200	Data Processing
Ames	500	Shipping
Ames	100	Accounting
Anderson	200	Data Processing
Anderson	200	Data Processing
Anderson	300	Marketing
Anderson	300	Marketing
Armstrong	200	Data Processing
Armstrong	300	Marketing
Austin	500	Shipping
Austin	100	Accounting
Bakaloff	200	Data Processing
Bakaloff	300	Marketing
Banning	300	Marketing

A *KeepIT* report showing employee names and departments and alphabetized by employee last names.

KeepIT is the heart of ITSoftware's IT Series of integrated programs. It comes with a thick manual in an IBM-style three-ring binder and four disks (one of them with several interface programs for other IT software) packed solid with data management routines. The documentation is neatly printed on semigloss paper. Much care has apparently gone into making *KeepIT* one of the more easily mastered relational data management systems.

About a quarter of the manual is devoted to a primer that provides a good, if superficial, overview of *KeepIT* procedures. There is no reference section as such, but the index and glossary are more than adequate, and you can use the main section of the manual as an in-depth teaching tool as well as to look up details of procedures. The novice should be able to set up a database and manipulate it with some confidence within a few hours, which doesn't mean that *KeepIT* is short on features. Through use of extensive menus and easily modified default conditions, *KeepIT* will make you feel it is running on automatic most of the time. Special routines such as report and list formats, read data specifications, compute/fill parameters, and interfaces with other programs can be saved and listed in a catalog. You can also create command files that will perform complicated but repetitive tasks utilizing several of the cataloged routines.

KeepIT's main menu will be unusually satisfying to database users now struggling with command-driven data managers. Its 30 options are neatly laid out, and you choose them by typing a combination of two letters or by moving an inverse video bar to your section with the cursor control keys and then tapping the Return key. The main menu allows you to choose modules for entering, changing, importing, sorting, and viewing data; defining the file or entry form constraints and fill values, designing and printing reports or labels, redirection of printer output, file management, creation of indexes, and accessing interfaces with other IT programs. Submenus, fill-in-the-blanks, and yes-or-no questions take you smoothly through each separate routine.

New data files are defined at the same time as you design data entry forms.



Much care has apparently gone into making KeepIT one of the more easily mastered relational data management systems.

ITSoftware
P.O. Box 2392
Princeton, NJ 08540
(800) 222-0592
List Price: $450
Description: Relational
Requires: 128K RAM (DOS 1.x), 192K RAM (DOS 2.x), 2 disk drives.
Records per File: 32,767

CIRCLE 676 ON READER SERVICE CARD

Instead of actually painting the entry form on the screen, you fill in prompted information about each field, including a prompt you can specify and each field's position. Nine pages are allowed for each form, and you can call up a display of the developing entry form as you go along. When you are finished, you can move the fields to areas on the form other than their default positions (to the right of the prompt). *KeepIT* does not give you the same degree of flexibility in creating entry forms that other data managers do, nor does it allow horizontal scrolling to create forms as wide as the paper ones you may be using now. You also cannot add to the entry form either extra titles or special information for the user. For most tasks, however, *KeepIt* data entry forms are perfectly adequate.

Compute and Fill

KeepIT has excellent compute and fill facilities. You can concatenate alphanumeric fields and write them to a third field, do global updating with computed fields, and work with dates by adding or subtracting days to or from a date, subtracting a date from another to get the number of days between them, or comparing two dates and keeping only the more recent one. For statistics, *KeepIT* can give you a count of alphanumeric records and produce sums, averages, standard deviations, and maximums and minimums of numeric values. It can produce mailing labels and lists with special functions usually associated with specialized mailing list programs. You can specify number of lines to be printed per label (up to eight), up to five labels across, column to start printing, horizontal and vertical space between labels, truncation length of fields, and commas automatically inserted after certain fields. *KeepIT* will even close up empty fields like a second address line on your labels.

Reports can be directed to printer, screen, or a disk file. You cannot design the actual report format by moving the cursor over a blank screen; *KeepIT* prompts you for information on report format and the fields reported including line skip, subtotals for columns or rows, statistics, suppression of column heading or repeated values or blank lines, truncation of fields, and select conditions for output of values by arithmetic or logical operators or wild cards. Up to 25 lines are available for output of single records; you merely inform *KeepIT* of the line on which you want each field value to be printed and exactly where on the line this value should appear. The report printout includes page numbers and, in the upper right, any two-line title of up to 40 characters per line that you specify.

> KeepIT is especially well suited to be a central software package in an integrated system. You can create any sort of new file from two others and output it to other IT Series programs.

Relational operations may be performed in either of two ways. If you have sorted previously, you can link two files in a report (a dynamic join) to get output of fields from both files. Alternatively, you can create a third file (a physical join) in the File Management module, sort it later, and prepare a report from this. Sorting is not a part of report creation; it is a separate but very fast operation. Potential purchasers of the *KeepIT* database management system should remember that in sorting large data files (over 500K), *KeepIT* requires about the same number of bytes as the data file itself. You can insert a sorting "work disk" in place of the *KeepIT* system disk when dealing with floppies, but you should keep an empty space on your floppy or hard disk equal in size to your largest file for sorting it.

KeepIT is especially well suited to be a central software package in an integrated system. You can create any sort of new file from two others and output it to other IT Series programs for spreadsheet analysis, graphics, mail list, forms, statistics and word processing. Data can also be output to *1-2-3*, *UltraCalc*, *EagleCalc*, *SuperCalc*, *Multiplan*, *WordStar*, *WordPlus-PC*, *WordPerfect*, *Wordix*, *PeachText*, *EasyWriterII/EasyFiler*, and *Spellbinder*.

Accomplishing the first *PC Magazine* test, an ad hoc query of two files extracting fields from both, was very easy. *KeepIT*'s report module simply asked for appropriate format and field parameters, including which fields were from the originating file and which from the linked file. The second test required the creation of a large third file by joining the two original files. I first created a new file-definition file by copying (with the Copy Files module) the Person file-definition file to a disk file renamed Task2. I then added additional fields to the data entry form through the entry form/file-definition screen in the File Definition module. I sorted the large Task2 file on two levels in the Sort module and then rapidly produced a report format to output all information in the new file. The generation, sorting, and output to screen of the Task2 file took quite a long time but was simple. Creating the report itself, frequently a long and tedious affair with other data managers, was quick and simple with *KeepIT*.

KeepIT relational operations are flexible, but I doubt that their execution will be difficult for a novice. The program ranks high in combining ease of use, flexibility, and restraint in demands on hardware.

—Richard Zander

(continued)

PROJECT DATA BASE

KeyBase: Arrested Development

```
On-Line 1) Data entry                                        ON-LINE
  1 Last name          |Horton
  2 First name         |Maggie      |
  3 Employee number    |278573
  4 Address            |2399 Cypress Rd
  5 City               |Portland
  6 State              |OR
  7 Zip Code           |97227
  8 Salary             |$14,300.00
  9 Department number  |500          .

Will NOT Save >>>
Cursor Control  | Screen Control |     Program      | Record Control |Record Status
Use ARROW Keys  | ^B-ack ^F-rwrd |ESC-save ^Q-uit|^O-Search ON/OFF|Current>    18
                |TAB-clrs ^X-jump|^A-Act ^E-xecut|^P-rev or ^N-ext|Total  >    26
```

A completed employee record as it appears in *KeyBase*. Note list of control key definitions at bottom of screen.

The *KeyBase* database design and management system is a clever application generator marred by a cryptic interface and abysmal documentation. It's the most ambitious product yet from SoftKey, which markets a line of programs including *KeyChart*, *KeyPrint*, and *KeyMailer*.

KeyBase evolved from *NUCLEUS*, a primitive applications generator created several years ago by Terry Barratt, a young Canadian. He bought an Osborne I and sat down to design a system that would automate 80 percent of the paperwork in his clients' offices. *NUCLEUS* spawned its own programs in the form of procedure tables. These encoded tables, used in conjunction with canned run-time functions called ON-LINE, REPORT, SORT, and PURGE, simulated applications that might ordinarily have taken months to develop if programmed individually.

Software Products, Inc.
2727 Walsh Ave.
Santa Clara, CA 95051
(408) 986-8148
List Price: $375
Description: Relational
Requires: 128K RAM, 1 disk drive, DOS 2.x.
Records per File: 32,000

CIRCLE 677 ON READER SERVICE CARD

NUCLEUS went through two revisions and was popular in the Toronto area, where it was available through Barratt's company, BASIC Assist. Barratt was able to make Version 4.0 PC-compatible, and he called in SoftKey to market it under the name *KeyBase*. Somewhere in the translation, though, Barratt's beautiful brainchild has grown into an ugly teenager.

Eight-Bit Genes

First of all, *KeyBase* clearly shows its 8-bit ancestry. In fact, no apparent effort has been made by Barratt or anyone else to convince this little program that it has a whole new world of memory to play in. Instead of commands, *KeyBase* gives you cryptic control sequences. Instead of helpful prompts, you get oblique one-liners like:

```
ESC-End CHG/DISK-D or Select !?!
```

KeyBase exploits few of the extraordinary powers of the IBM keyboard. It uses none of the function keys, and the way it uses other special keys is bizarre. To tab to the next field, use the right cursor key; to clear the screen, use Tab. To insert text, use Ctrl-I: to delete, use Ctrl-G. To enter Data, hit the Enter key first, then key it in, then hit Enter again. You exit various program phases via Ctrl-C, Ctrl-E, Ctrl-Q, END, Enter, or Esc. This nonsense may have been par for the course on an Osborne I, but on the PC it's just a sand-trap.

Other problems date back to *NUCLEUS*. The most confusing aspect of *KeyBase*'s often clever design is what Barratt calls *modes*. These are assigned to display screens and fields and seem to imply functional permissions. Mode 1 allows only existing records to be accessed. Mode 2 assigned to a field means data entry is required. Mode 3 supports existing records whose key is supplied via a transfer operation. Mode 4 automatically runs the associated actions while on-line. There are eight of these modes, and each is nastier and more abstract than the last.

KeyBase's unique capability to add and subtract *alphanumeric* fields sounds like great news, but this turns out to be yet another vulgarization of language. Addition is defined here as string concatenation with optional blank compression, which at least has parallels in classical programming languages. But the subtraction function will try to convince you that "No Good" minus "Bad" equals "Good."

The program has minor annoyances as well. The installation instructions for *KeyBase* violate all generally accepted standards of safety by insisting that you should not write-protect the master copy before running a batch file that writes to it. Any properly designed installation procedure will insist that you make a copy of the master, put the master in some safe place, and then run the INSTALL.BAT program on the copy.

The Written Word

KeyBase's documentation is the worst I have ever seen. It seems to have been transcribed—by someone totally unfamiliar with English punctuation—from a hissing

tape made by a rambling techie deep into a blind drunk. Just try reading 163 pages of teeny, tiny print that begins: "*KeyBase* is unlike other Database Managers. It is also unlike any General Purpose File Manager.



KeyBase is a product with real potential. It could be a boon to thousands of small businesses and probably will be someday.

That makes *KeyBase* different from anything else to date."

Add to that Guinness record-breaker such exalted hyperbole as, "As you can see, with *KeyBase*'s capability to link Action with Displays, almost anything can be accomplished when working with Databases." Shouldn't somebody tell the president?

The author of this document has chosen to capitalize about every fourth word. In English, unlike, for example, German, capitalization is intended to identify proper nouns. Here, however, it is often used for mere emphasis. Even Verbs sometimes Get this treatment. After I Had Spent 2 days, Wading through this stuff, I Learned to completely Ignore the nutty Punctuation.

The tutorial is buried in the appendix, and you are warned not to read it before comprehending the rest of the manual. But I finally discovered a simple way to master *KeyBase:* I merely kept Barratt on the phone for 4 hours and made him guide me step-by-step through the design and execution phases of a sample database application. It was amazing how the thing submitted to his long-distance instructions when it hadn't done anything for me but snicker. I was finally able to see just how many clever things *KeyBase* can do, and I learned a great deal about its theory of operation as well.

For instance, *KeyBase* uses a binary search to access records directly. That means that records must be fixed length, as in most other database systems, and trailing blanks can't be truncated to save space. Furthermore, if you have duplicate keys you aren't guaranteed to access the first duplicate first, though browsing via Ctrl-P (prior) and Ctrl-N (next) will orient you soon enough. Although the manual says that you can find any record in 10,000 within around 15 tries, this can't compare with a file with two or more levels of indexing.

In order to import data into the system you need to start each field on a fixed column boundary and see to it, somehow, that each entire record is surrounded by quotation marks. Then you must add a header record of the form

```
i,k,"
```

where i and k (called the SORTED and SERIAL markers) give the number of sorted records and the total number of records respectively. The empty string simply forces the record length to be equal to all the other records in the file. If the binary search fails, the markers tell the program to serially search any records appended after the last sort.

Several days before going to press, incidentally, SoftKey surprised us with the news that the product it had sent for review would be greatly improved before being released this summer. That was a good one on us—*PC Magazine* prefers to review products that people can actually purchase. However, it did help to explain why only the second of the two "Corrected diskettes" I received allowed me to to do any useful work at all with *KeyBase*.

KeyBase is a product with real potential. A labor of love, finely honed by a man with a solid understanding of garden variety paperwork, it could be a boon to thousands of small businesses and probably will be someday. For now, however, it is trapped in that corner of time and space known as the arrested development zone.—**Dean Hannotte**

```
Field Dictionary 1) Data entry                                        ON-LINE
   Prompt                      Help Message    Size Type  Display Format

  1Last name                                     15    A
  2First name                                    11    A
  3Employee number                               6     N    ######
  4Address                                       30    A
  5City                                          20    A
  6State                      Two-letter abbr    2     A
  7Zip Code                                      5     N    #####
  8Salary                     Max=$99,999.99     8     D2   $##,###.##
  9Department number          3-digits           3     N    ###
 10Department number                             3     N    ###
Prompt       = simple text as Field Identifier
Size column  = Field length 1-2000 characters
Type column  = A-alphanumerics  N or N# for Numerics  D or D# for Dollars
Format       = ($),(#),(,),(.),(-) for Numerics  any Characters for Alphas

Cursor Movement  | Definition  | Special Function | Exit to Menu
                 |  ^G-delete  |  ^Y-get Fields   |
Use ARROW Keys   |  ^I-insert  |  ^T-test Dis/Prt | ^B-ack to Menu
[RET]-Enter      |  ^R-eplicate|  ^P-print Dict   |
Maximum Nbr Allowed/Spec | 100 / 12
```

KeyBase's dictionary of fields, showing aspects specified by user.

PC WEEK

THE NEWS WEEKLY FOR IBM SYSTEM MICRO COMPUTERS

The first weekly newspaper designed to give key executives the latest IBM Personal Computer news and analyses—*as soon as it happens!*

To keep your company in the forefront of today's rapidly changing IBM Personal Computer technology, you need timely information. Information that's clearly written, bringing you the news the way you need it, when you need it. You need PC WEEK.

PC WEEK is the first and only weekly newspaper devoted to IBM Personal Computer news—with the latest breaking stories as they develop.

PC WEEK follows and reports the news—up to 48 hours before publication—so you learn what's new *when* it's new! You'll find research updates, strategic analysis, new hardware and software reviews, insights on future industry concerns and controversies, and the timely information you need to help make you more productive and efficient.

Every week you'll find outstanding features and departments covering...

- **NEWS: PC WEEK brings you analytical reports on the major topics of the day. Product announcements and company changes are analyzed and put into perspective, helping you plan for future investments and developments.**
- **STRATEGIES: Every week you get an in-depth profile of a leading user company and how they use their IBM and compatible personal computers. Case studies help you evaluate the success and failure of new applications—some you even may have been considering.**
- **INDUSTRY TRENDS: Discover what's happening behind the scenes in new product development from both hardware and software manufacturers and what this could mean to the future of your company.**
- **PRODUCT REVIEWS: In-depth reviews of important new hardware and software releases tell you what product is right for your operation, *and* the technical and financial considerations involved.**
- **FOCUS ON: The latest news and events in specific product areas are detailed every week. We cover file systems, 3270 products, graphics software, input hardware, database managers, program generators, multifunctional applications—the information you need for your IBM installation.**
- **BUYERS GUIDES: Special sections with careful evaluations and comparative charts to help you select the proper peripherals and software packages for your operation. From word processing to local area networks or compatibles, you'll find complete and unbiased reviews and listings.**

Your subscription to PC WEEK is complimentary if you qualify. Take a moment, fill out the Qualification Form at right and return it to PC WEEK today.

PC WEEK, your vehicle to stay in the forefront of tomorrow's IBM Personal Computer technology.

PC WEEK

Get the news you need every week, *first hand*, with PC WEEK.

PC WEEK THE NEWS WEEKLY FOR MINICOMPUTER & MICRO COMPUTER USERS

Complimentary Subscription Application

YOU MUST ANSWER ALL QUESTIONS TO QUALIFY.

Full company name and company address must appear in spaces below for application to be processed.

OR AFFIX YOUR BUSINESS CARD PW 1146

Name

Title

Company Name

Division | Telephone Number

Company Street Address

Company City | State | Zip

1. ☐ **Please accept my request for a complimentary subscription to PC WEEK.**

2. ☐ **No, I do not want to receive PC WEEK.**

3. Primary business activity of your firm at this location (check one only):

- ☐ 1. Manufacturing of computer equipment, computers, DP hardware, peripherals
- ☐ 2. Manufacturing other
- ☐ 3. Agriculture, mining, construction
- ☐ 4. Transportation
- ☐ 5. Communications
- ☐ 6. Utilities
- ☐ 7. Computer related retailer
- ☐ 8. Non-computer related retailer or wholesaler
- ☐ 9. Finance, banking, insurance, real estate
- ☐ 10. Health, medical service
- ☐ 11. Legal
- ☐ 12. Education
- ☐ 13. Data processing, computer service
- ☐ 14. Other business services
- ☐ 15. Government
- ☐ 16. Consultant
- ☐ 17. Other (please specify)

4. Your title: (Check one appropriate box)

- ☐ 1. Pres/Owner/Dir/Chmn/Partner
- ☐ 2. Vice-Pres/Gen Mgr
- ☐ 3. Comptroller/Treasurer
- ☐ 4. Vice-Pres Finance
- ☐ 5. Chief Accountant
- ☐ 6. Vice-Pres Operations
- ☐ 7. Dir/Mgr Purchasing
- ☐ 8. Dir/Mgr Office Systems
- ☐ 9. Vice-Pres Sales/Sales Mgr
- ☐ 10. Dir/Mgr Marketing
- ☐ 11. Dir/Mgr/ Chief of EDP/MIS
- ☐ 12. Dir/Mgr Programming
- ☐ 13. Dir/Mgr Systems & Procedures
- ☐ 14. Dir/Mgr Communications
- ☐ 15. Dir/Mgr EDP/MIS Operations
- ☐ 16. Dir/Mgr Information Ctr
- ☐ 17. Business Microcomputer Specialist
- ☐ 18 Systems Analyst
- ☐ 19. Data Base Administrator
- ☐ 20 Vice-Pres/Dir R&D
- ☐ 21. Vice-Pres/Dir Engineering
- ☐ 22. Dir/Mgr Plant or Prod
- ☐ 23. Chief Engineer
- ☐ 24. Systems Engineer
- ☐ 25. Design/Production/Research Engineer
- ☐ 26. Consultant
- ☐ 27. Educator
- ☐ 28. Other (please be specific)

5. Do you have any *MAINFRAME* computers or *MINICOMPUTERS* on site at this location?

☐ Yes (If yes, please report accurately below for the two largest.)
☐ No

Manufacturer	Model	Quantity

IBM or Compatible Personal (Micro) Computer Information for this location:

(Please report accurately for each model indicated)

Manufacturer's Name, Model	6. Currently Owned (Quantity)	7. Plan To Purchase Within. 0-12 Months (Quantity)	13-24 Months (Quantity)	25-36 Months (Quantity)
IBM PC				
IBM PC XT				
IBM XT/370				
IBM PC/3270				
IBM PCjr				
IBM Compatibles (Compaq, Eagle, etc.)				
Other (Not IBM or Compatibles)				

7a. In which of the following ways are you yourself involved with the *Personal (Micro) Computers* at your location?

- ☐ A. Use them
- ☐ B. Recommend them
- ☐ C. Establish specifications
- ☐ D. Approve purchase
- ☐ E. Acquire them
- ☐ F. Other involvement (specify) _____
- ☐ G. No involvement

8. The *Personal (Micro) Computers* purchased for this location would be:

- ☐ 1. For internal use
- ☐ 2. For resale
- ☐ 3. Other (please specify) _____

8a. How are Personal (Micro) Computers normally obtained for this location?

- ☐ A. Direct from manufacturer
- ☐ B. Manufacturers representative
- ☐ C. Distributor
- ☐ D. Retail computer store
- ☐ E. System house
- ☐ F. In-house (company) store
- ☐ Z. Other (please specify) _____

9. Please indicate below the communications capability for which these *Personal (Micro) Computers* are used.

- ☐ A. Communicate with remote timesharing or database.
- ☐ B. Communicate with internal mainframe or minicomputer.
- ☐ C. Used in local area network.
- ☐ D. Down load data from mainframe or remote service.
- ☐ E. None of the above.

9a. Please indicate below the applications for which these *Personal (Micro) Computers* are used.

- ☐ 1. Accounting
  - ☐ A. Accounts Payable
  - ☐ B. Accounts Receivable
  - ☐ C. Billing & Collection
  - ☐ D. General Ledger
  - ☐ E. Inventory
  - ☐ F. Order Entry & Invoicing
  - ☐ G. Time Billing
- ☐ 2. Communications
- ☐ 3. Data Base Management
- ☐ 4. Data Input/Analysis
- ☐ 5. Education
- ☐ 6. Electronic Mail
- ☐ 7. Entertainment (Games)
- ☐ 8. Financial Planning
- ☐ 9. Graphics Design
- ☐ 10. Personal Time Management
- ☐ 11. Portfolio Management
- ☐ 12. Programming
- ☐ 13. Project Management
- ☐ 14. Process Control
- ☐ 15. Scientific or Engineering Applications
- ☐ 16. Statistical Analysis
- ☐ 17. Tax Calculation or Planning
- ☐ 18. Word Processing
- ☐ 19. Other _____

10. Do you help acquire, recommend, specify or approve any of the products or services below?

☐ Yes (If yes, please check all that apply)
☐ No.

Computers
- ☐ 1. Mainframe
- ☐ 2. Minicomputer
- ☐ 3. Personal (Micro)

Peripheral Equipment
- ☐ 7. Letter Quality Printer
- ☐ 8. Graphics Printer
- ☐ 9. High Speed Printer
- ☐ 10. Color Monitor
- ☐ 11. Monochrome Displays
- ☐ 12. Modems
- ☐ 13. Hard Disk
- ☐ 14. Tape Backup System
- ☐ 15. CPU Compatibility Card
- ☐ 16. Memory Board
- ☐ 17. Communications Port
- ☐ 18. Plotters/Charting Devices
- ☐ 19. Local Area Networks

Software Packages
- ☐ 21. Communications
- ☐ 22. Accounting
- ☐ 23. Order Entry/Inventory
- ☐ 24. Payroll
- ☐ 25. Time Billing
- ☐ 26. Financial Planners/Spreadsheet
- ☐ 27. Project Managers
- ☐ 28. Word Processors
- ☐ 29. Compilers
- ☐ 30. Database Managers
- ☐ 31. Program Developers/Generator Tools
- ☐ 32. Business Graphics

Outside Services
- ☐ 34. Maintenance
- ☐ 35. Education/Training
- ☐ 36. Software/Systems Design
- ☐ 37. Remote Computing
- ☐ 38. Database Services
- ☐ 39. Other

Expendables
- ☐ 41. Diskettes
- ☐ 42. Stock Paper
- ☐ 43. Forms & Other Consumables

11. Are there any other individuals at this location that would qualify for a complimentary subecription to PC WEEK?

Name _____ Title _____

Name _____ Title _____

Your Signature _____

Your Title _____ **Date** _____

Please be sure to sign your name and list your actual title above
See other side for mailing instructions.

SEAL THIS SIDE ONLY—DO NOT USE STAPLES

FOLD HERE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 3838 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE

PCWEEK

P.O. Box 5920
Cherry Hill, NJ 08034

Your IBM® PC is smarter than you think.



It's really a terrific computer once you get the hang of it. But getting through the IBM manuals can really hang *you* up.

Unless you do it the smart way. Using Ashton-Tate's Reference Encyclopedia for the IBM Personal Computer.

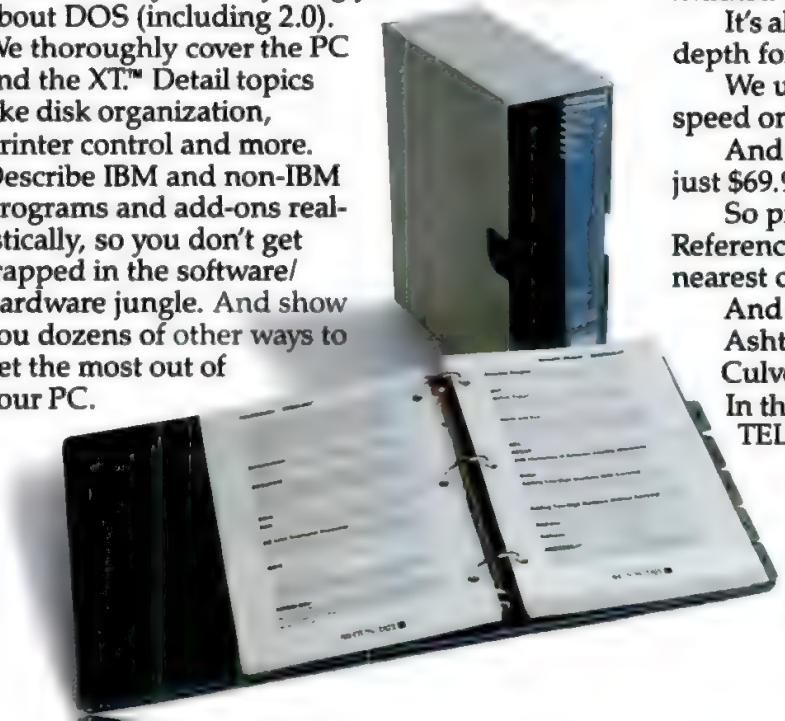
The IBM PC Reference Encyclopedia.

Authors Gary Phillips and Karen Phillips took everything you might even *think* you'd want to know about your IBM PC and compatible products, and assembled it all in one place.

This Second Edition of our Encyclopedia is two volumes jam-packed with information that gives you the meanings behind the manuals and keeps you current on compatible software and hardware products.

Inside, you'll find several thousand quick-reference entries and over a hundred in-depth "how-to" items.

We'll tell you everything you need to know about DOS (including 2.0). We thoroughly cover the PC and the XT.™ Detail topics like disk organization, printer control and more. Describe IBM and non-IBM programs and add-ons realistically, so you don't get trapped in the software/hardware jungle. And show you dozens of other ways to get the most out of your PC.



We've compiled tables and reviews you won't find anywhere else. Gathered hundreds of practical tips and techniques from magazines, newsletters and dozens of experienced users, so you won't have to learn them the hard way.

It's easy to take.

We've made all this information easily accessible, because the Encyclopedia is efficiently indexed and thoroughly cross-referenced.

It's all explained in plain English with enough depth for both novice and intermediate users.

We update it twice a year, to keep you up to speed on all the new developments.

And it's all yours for a suggested retail price of just $69.95. Including two free updates.

So pick up a copy of the Ashton-Tate IBM PC Reference Encyclopedia (Second Edition) at your nearest computer or software store.

And stamp out manual labor today.

Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (213) 204-5570.
In the U.K., call (0908) 568866.
TELEX: 664228 ASHTATE CULV.

ASHTON·TATE™

IBM and XT are trademarks of International Business Machines.
©Ashton-Tate 1984

CIRCLE 157 ON READER SERVICE CARD

An Automatic Approach to Networks

PFS:ACCESS is a handy program for informational data-base subscribers. Teach it to sign on to your network and it will take over and do the job for you.

Immediate access to all sorts of business, leisure, and news information at the touch of a finger is something no true executive can resist. *PFS:ACCESS* is a new software package that further streamlines the connection between users and the networks to which they subscribe.

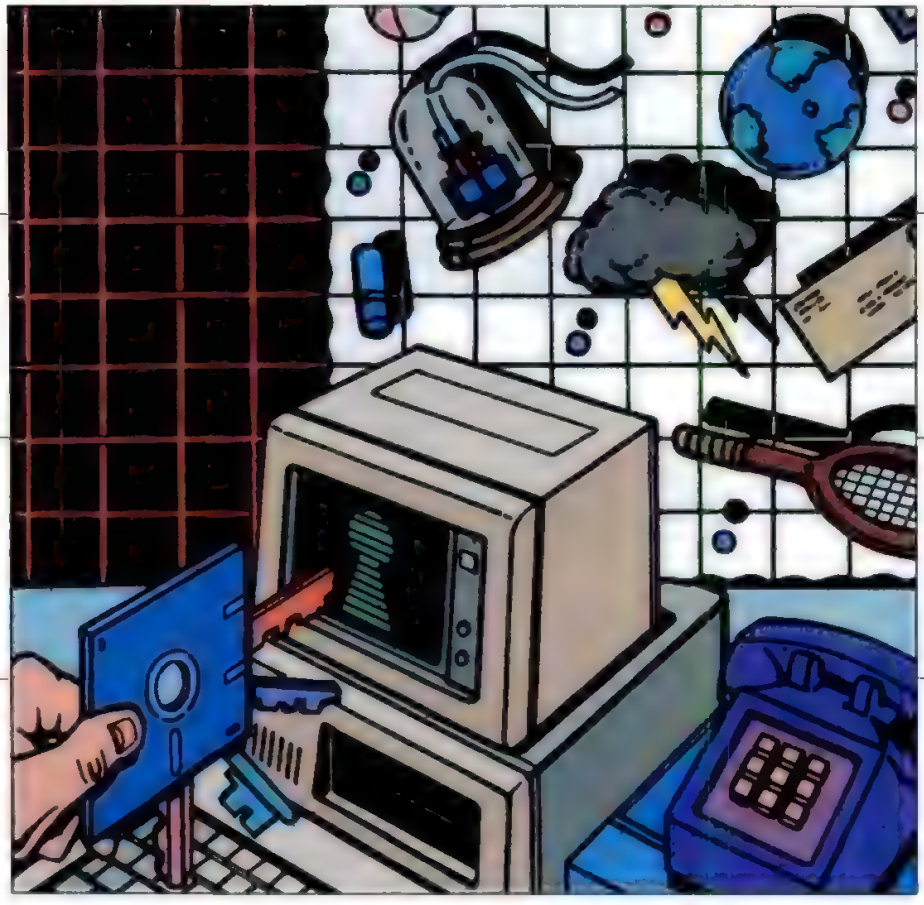
According to the manual, *ACCESS* performs four tasks: It sets up the computer and modem to be compatible with the network, dials the service, signs on, and allows you to use your computer as a terminal. It also lets you save information coming in from the service and print that information at any time.

The package comes with a fairly clear manual and a disk containing the *ACCESS* main program, a setup program that allows you to customize *ACCESS* for a printer or for certain compatible machines (for example, if you are using a Compaq, which has a monochrome screen with a color graphics card, you have to adjust the program), and a sample letter to test the software.

ACCESS is totally menu driven. The Main menu, which you call up by typing Access, gives you an immediate choice among five popular services (CompuServe, Dow Jones, EasyLink, MCI Mail, and The Source), three free slots for other services, a category labeled Choose Modem, and Exit. (See Figure 1.) The screens, deep blue with gray and yellow lettering, are quite distinguished and easy to read. Highlights are a fuzzy white, and error messages appear in bright red.

Choose Your Modem

According to the manual, after copying the software the first-time user must begin by selecting Choose Modem. This category then presents a list with 14 choices: 12



commercial modems, Acoustic, and Other. (See Figure 2.) You must specify whether your modem connects to COM1: or COM2: and whether your phone is rotary or touch tone. *ACCESS* is then ready to be used.

On my first try, I decided to send myself an electronic letter on MCI Mail. I chose the appropriate number from the main menu and was presented with a new menu divided into two parts: Service Information and Communications Settings. Since I had entered a pre-existing category, much of the information about MCI Mail was already entered, including the name of the service and all communications settings: modem speed, data bits, stop bits, parity, and half or full duplex. There was a blank space left for the telephone number and another asking if I wanted to create an automatic sign-on.

You travel down through the categories by using the Tab key and up by using the shift and Tab key together (I found that the up and down arrows also work, although they do not go directly from category to category). The defaults are easy to change by typing over the existing data; new settings are automatically saved.

ACCESS is driven by the computer's function keys. Once you have entered the phone number, you can immediately hit the F10 key to begin dialing the system. F10 is also used as a safety device when you ask for a change in the program; for example, when you exit a service, a message will appear on the screen asking you to hit F10 if you want to exit or Esc if you change your mind.

ACCESS's automatic sign-on function is the key to simplifying the process of entering a network. Once the program has recorded the automatic sign-on function properly, you can thereafter call up *ACCESS*, choose the network, and then sit back while all the work is done for you. In order to set the processs in motion, I put a Y next to the question "Create Automatic Sign-on?" and hit the F10 key.

A message appeared in the center of the screen, telling me that the machine was dialing the number. (If I had previously registered an automatic sign-on, the program would have first asked if I really wanted to change the procedure.) With the connection made, the program immediately shifted to the terminal screen.

Most of the space on the screen is reserved for communications with the service, except for the very top line, which names the service currently in use, and the very bottom, which is reserved for the *ACCESS* menu and messages. The menu tells you which function keys to use for help, print, disconnect, send, and save.

If you are creating an automatic sign-

Illustration: Brad Hamann

on, a highlighted message will also appear, telling you to hit F4 to stop the sign-on process. As long as that message is on, *ACCESS* is recording every service prompt and user response.

For Repeat Users

The automatic sign-on is especially useful if you use a particular feature of your service frequently. For example, I decided to enter one of the open Other Service slots on the Main menu to create a sign-on that would take me directly to the Source's news report. After entering the Other Service screen, I named it The Source-USNEWS, set the parameters, typed in the phone number, and told *ACCESS* to set the automatic sign-on (see Figure 3). I kept the sign-on going until I reached the USNEWS feature, signed off, went to the *ACCESS* main menu (which now contained the name of my new field), and then tried again. *ACCESS* ran through its paces perfectly, and I didn't have to twitch a finger to find myself right in The Source's news. (see Figure 3.)

The automatic sign-on is especially useful if you use a particular feature of your service frequently.

Of course, this system is not perfect. If anything at all goes wrong while you're recording the automatic sign-on, the program will cheerfully record the mistake as well. You're likely to discover your mistake later, possibly when you'll find it most inconvenient. For example, the first time I entered MCI Mail, I hit the Return key twice. That didn't bother MCI Mail, but when I later tried to get *ACCESS* to sign on for me, it gave a control code as my MCI Mail ID.

In addition, you have to remember to halt the process (by pressing the appropriate function key) when your sign-on is complete. I omitted that crucial step the first time I signed onto the Source, and the next time I tried to get into the Source, *ACCESS* dialed the number, made the connection, signed on, and then signed off for me—I wondered whether the computer was bored and had decided to take things into its own hands.

Once you are inside a network, you essentially follow its rules, although *ACCESS* does allow you to use its own scroll up and scroll down facilities. You

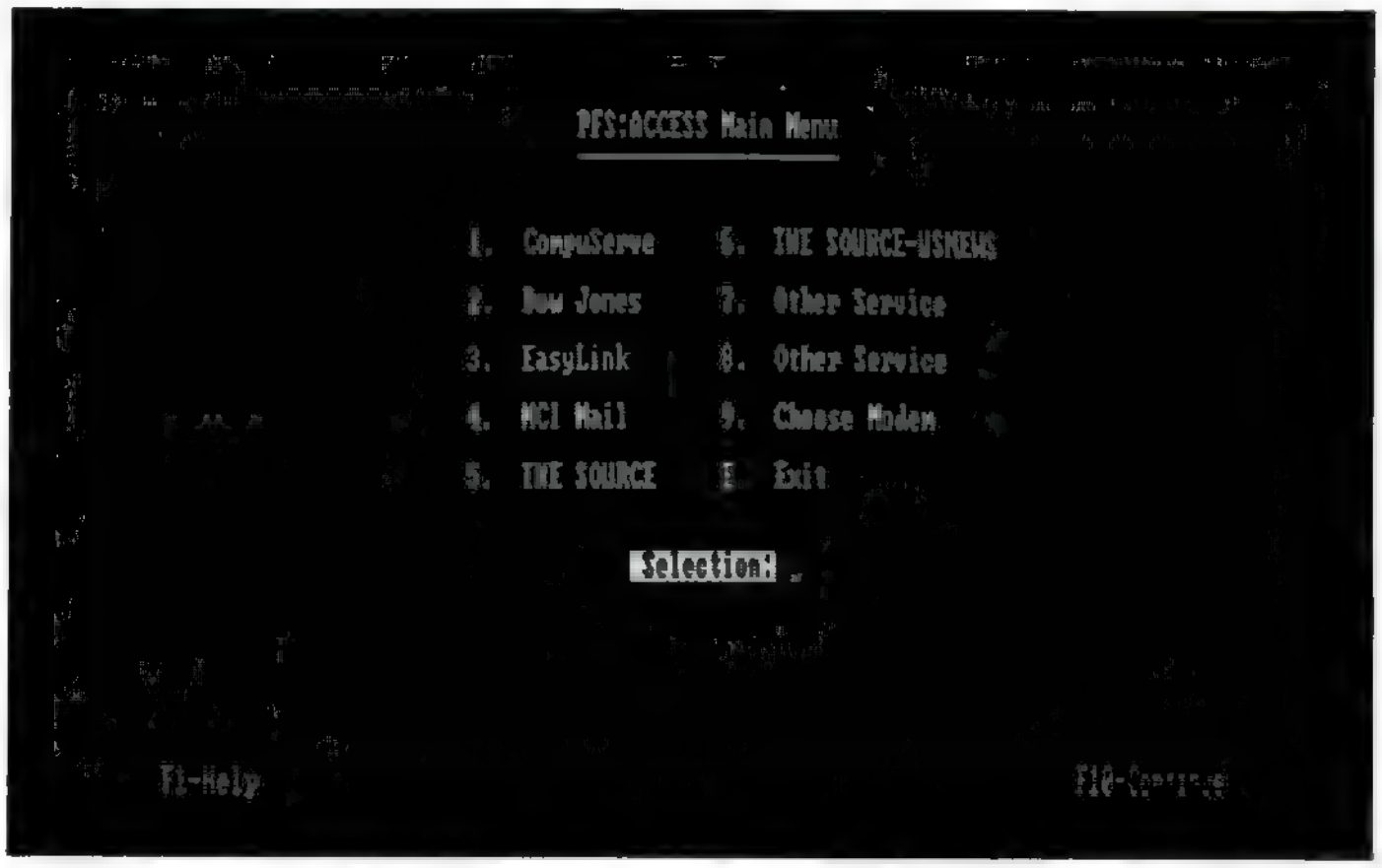


Figure 1: *The* PFS:ACCESS *Main menu; with one of the Other Service slots used.*

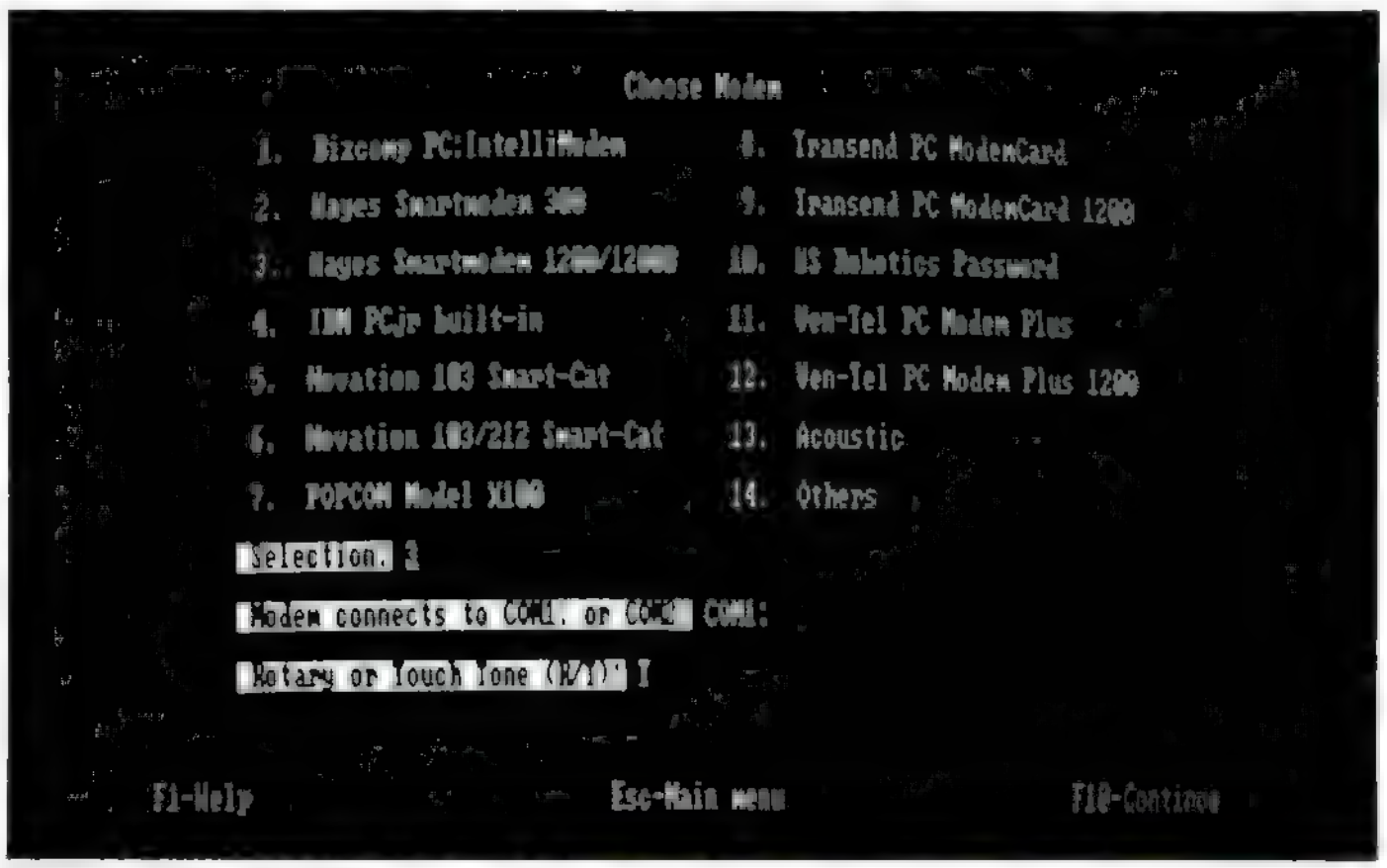


Figure 2: *The* ACCESS *Choose Modem menu.*

PFS:ACCESS
Software Publishing Corporation
1901 Landings Dr.
Mountain View, CA 94043
(415) 962-8910
List Price: $95
Requires: 128K RAM, one disk drive, modem, PC-DOS.

CIRCLE 696 ON READER SERVICE CARD

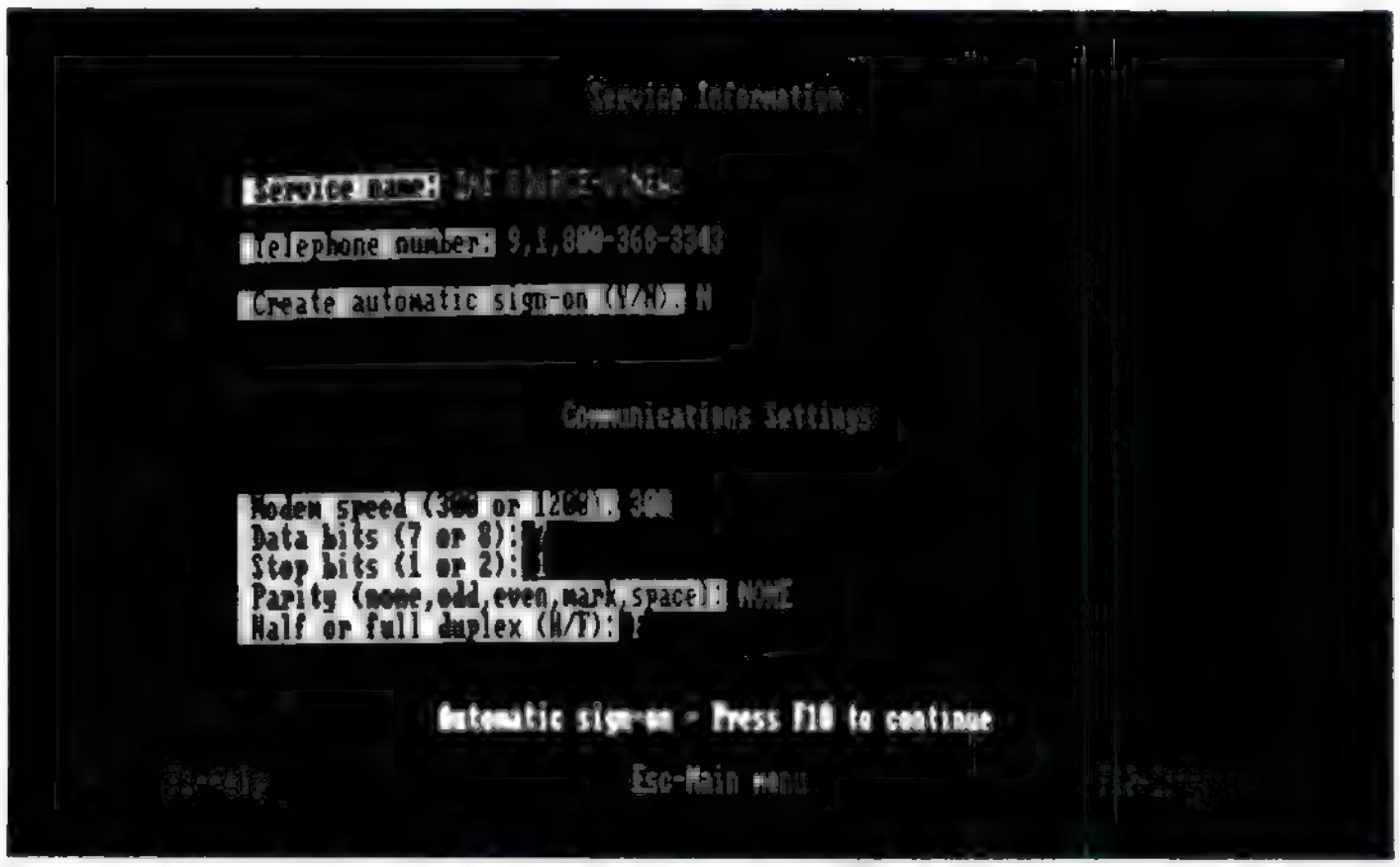


Figure 3: *The screen setup for The Source-USNEWS.*

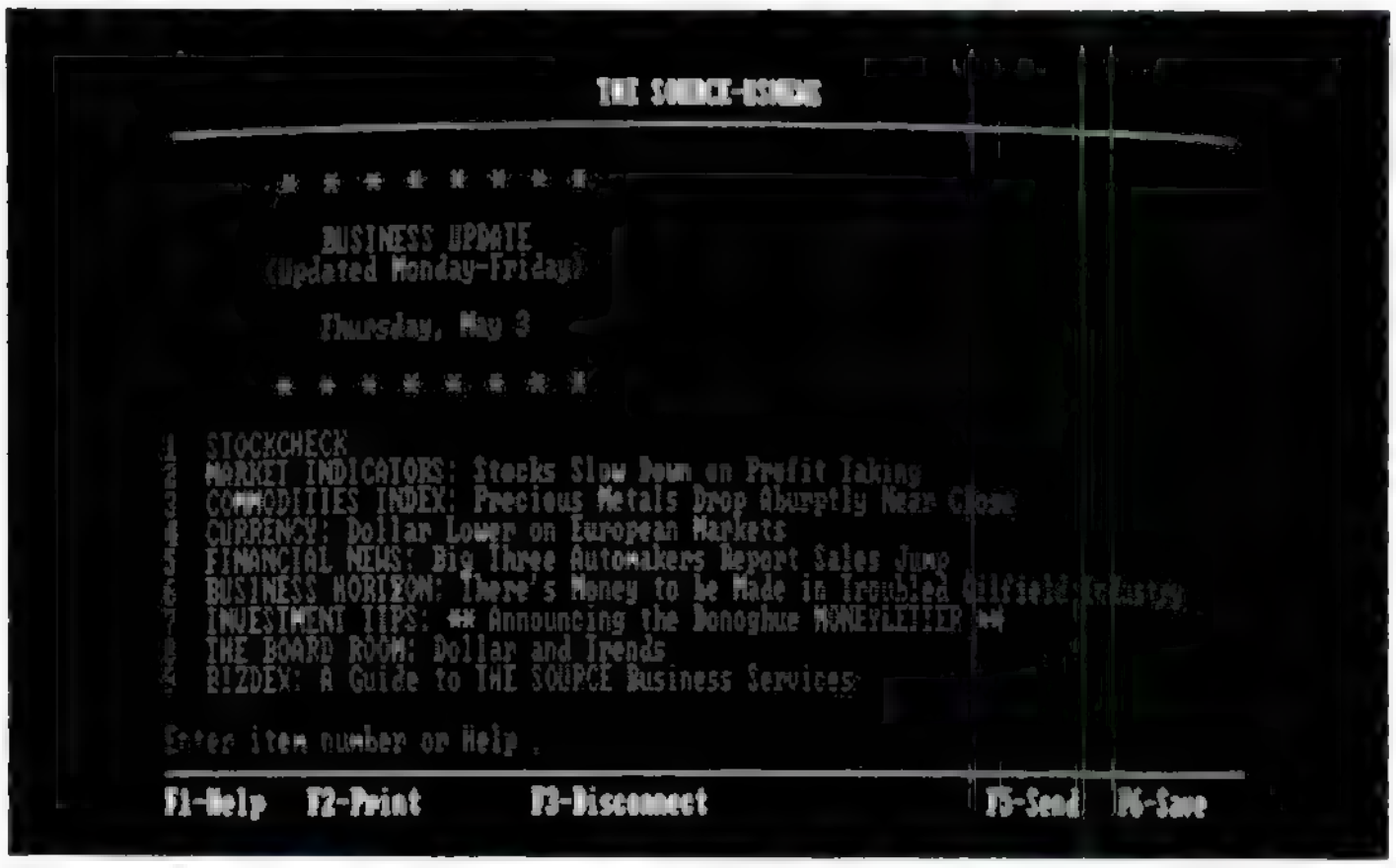


Figure 4: *One keystroke takes you from the screen above into The Source-USNEWS.*

can also print everything you are receiving by simply hitting the F2 key (a highlighted message will remind you to hit F2 again to stop printing).

ACCESS handily allows you to send a presaved file. If you hit the F5 key, a small box appears at the bottom of your screen asking for the file name and a privacy code. If you simply want to send the file, you type the name and hit the return and the program will begin sending. If you want the message garbled, press the Tab key and then choose a security code.

The code, any eight characters you choose, ensures a reasonable amount of security for your document. Once you enter the code, any text you send will be garbled by the program automatically, using (according to the manual) a coding process based upon the Data Encryption Standard of the National Bureau of Standards.

You can read the message back only by saving the file, using the *ACCESS* Save function, and entering the security code when asked. The program will then save the message as it was entered. You can also save any part of your transaction by the same process.

The Software Publishing Company's two word processing packages, *PFS:REPORT* and *PFS:WRITE*, are both said to be compatible with *ACCESS*. Other word processors are compatible as well; when I sent myself an electronic letter through MCI Mail using a *WordStar* file, the program accepted it and reinterpreted the coded message with no problem.

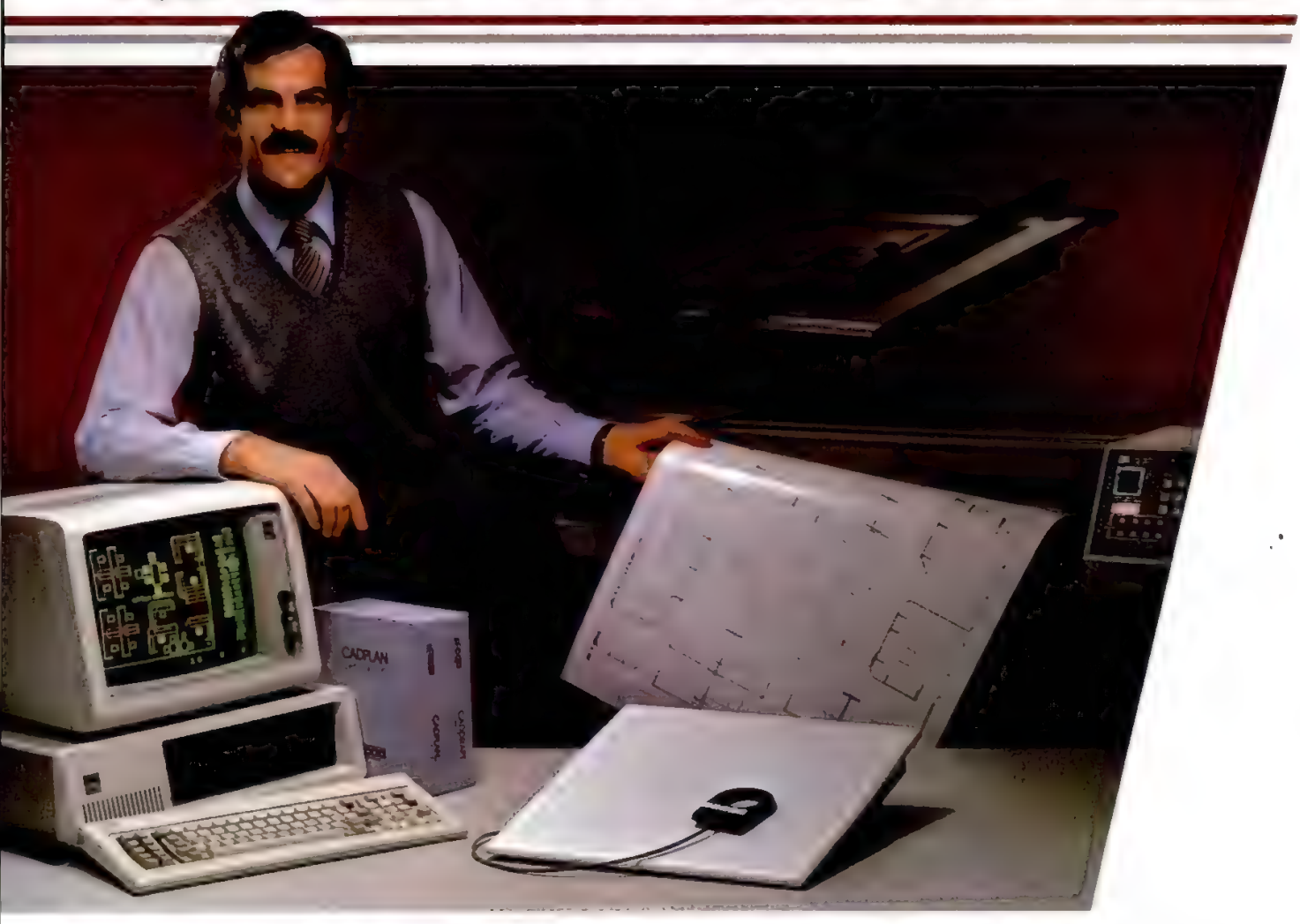
Connection Confusion

ACCESS usually had no trouble dialing and making connections but if I broke a connection and then tried to redial immediately afterwards, the program sometimes experienced difficulty. At one point, after I had tried without success to dial MCI MAIL three times, the program rebelled and asked me to insert the *ACCESS* disk in drive A:. Since the disk was already in drive A:, I was puzzled, but after trying to remedy the situation first by hitting F10 again and then by reinserting the disk, I gave up, exited the program, and re-entered.

As I exited, I discovered a second problem. There are no instructions for putting DOS on the *ACCESS* program disk, so when I hit E for exit at the Main menu, the computer obediently exited into a ROM request for COMMAND.COM. Since I had the *ACCESS* disk in drive A: and my data disk in drive B:, I had to find my DOS disk, reboot, and then re-enter the program—which was inconvenient.

ACCESS is a very handy little program if you are a frequent user of microcomputer networks or information systems. It has definite limitations; it assumes that you will only use up to eight services, and it is only useful for signing on to communications networks—it is not set up for computer-to-computer conversations. The harassed businessperson will find *ACCESS* useful, but people who want to use their modems for more than simply accessing networks should be able to find more flexible communications programs. ■

NOW COMPUTER-AIDED DESIGN COSTS LESS THAN A DRAFTING TABLE.



TOOLS FOR MODERN DESIGN™

For only $1,200–less than the price of a top-quality drafting table–you can add computer-aided design (CAD) capabilities to your IBM PC or compatible personal computer.

Introducing CADPLAN,™ a complete user-friendly computer-aided design package for architects, facilities planners, engineers and designers that can increase your productivity by reducing the time you spend on tedious, repetitive tasks and costly design changes.

CADPLAN combines the power and performance of large-scale CAD systems with the ease of use and low cost of the IBM PC. CADPLAN includes many advanced capabilities found in costly CAD systems, such as real-time "rubber-banding," multi-layering and symbol libraries. An optional database extraction feature allows you to perform job costing and analysis as an integral part of the design process.

The CADPLAN design package is part of a growing family of easy-to-use CAD software from Personal CAD Systems, Inc. Software for logic design and printed-circuit board layout is also available, with more CAD products to follow.

Personal CAD Systems is committed to providing the level of after-sales service and support you need to get your job done quickly and efficiently. Examples of this commitment include CADMATE,™ a self-paced, step-by-step tutorial that teaches you how to use CADPLAN, and CADDRAFT,™ an entry level drawing and drafting system. We also support a wide variety of input and output devices.

To find out more about the benefits of low-cost computer-aided design, write or call toll-free 800-882-7535 (in California, 800-635-8306), and ask for our free brochure, "Tools For Modern Design."

CADPLAN. It will revolutionize the way you work and think.

©1984 Personal CAD Systems, Inc. CADPLAN, CADMATE and CADDRAFT are trademarks of Personal CAD Systems, Inc. IBM is a trademark of International Business Machines Corporation.

981 University Avenue
Los Gatos, Calif 95030
(408) 354-7193 TELEX 278866

p-cad™
PERSONAL CAD SYSTEMS INC.

CIRCLE 523 ON READER SERVICE CARD

Tailoring DOS To Fit

DOS permits you to adapt the system to meet your needs. You can set up custom file systems and create batch commands for file access, backup, and record management.

This article is excerpted from Chapters 15 and 16 of Running MS-DOS *by Van Wolverton, to be published by the Microsoft Press division of Microsoft Corporation. The book is a tutorial on the MS-DOS operating system, which Microsoft developed. Chapter 16, which forms the major portion of this material, describes ways of tailoring DOS to fit your needs.*

The author, Van Wolverton, has been a professional writer for 20 years and a technical writer for the last 10. His work at Intel and IBM before joining Microsoft has given him special insight into DOS and the workings of IBM PC.



You will note that the typographic conventions for DOS commands in the figures and program listings are different from those PC *usually uses. To avoid confusion, we have followed the conventions Microsoft used.*

Although it may sometimes seem that DOS offers more options than you need, those options give you flexibility in tailoring DOS. This article shows you several ways to tailor DOS to your needs or preferences. Not only does this tailoring make DOS fit your work needs better, some of the techniques described here can make your system immediately useful without commercial application programs. And tailoring can also make it easier to achieve consistency in such procedures as backing up a fixed disk, if several people will be using the computer.

This article describes the following items:

- Different ways to set up a filing system that matches the way the computer is used.
- Batch commands that simplify use of a multilevel filing system.
- Batch commands that automate backing up a fixed disk.
- Several simple record-management schemes similar to that used in sorting the telephone index in Figure 1.
- A few of the less frequently used DOS commands.

Setting up a Filing System

It doesn't take long to set up a file system under DOS—all you need are a few Make Directory (MKDIR) commands—but it can be time-consuming to change a file structure after dozens or hundreds of files have been created. A few minutes' thought about who will use the computer, and what they'll use it for, can result in a file structure that suits the way the computer is used.

In the following examples, the root directory is assumed to contain the DOS command files, general-purpose batch files, and any other files that are needed by anyone using the system regardless of the current directory. They are especially appropriate if your computer has a fixed disk on which you store all your programs and current data files.

An Application-Based File System. If a computer is used for several applications—as it would be by an independent professional or a small business—a natural way to organize the file structure is by application program. Figure 2 shows how a file system might be set up by an independent professional who uses the machine with word processing, spreadsheet, and database management programs.

The first level of directories (WP, SPREAD, and DATABASE) contains the applications programs. The next level (BUSINESS, CLIENTS, PERSONAL) holds the data files for the applications.

With this file structure, when someone does some word processing, for example, the current directory is that which contains the document files (such as \WP\BUSINESS or \WP\PERSONAL). The PATH command is used to set the command search path to the root directory (for DOS commands and general-purpose batch files) and to \WP (for the word processing program).

On the other hand, the file system for a computer used in a small business might make the second and subsequent directory levels correspond to the departments that use the applications, rather than to the data files for the applications. Figure 3 shows how such a file system might be set up.

A Department-Based File System. Rather than beginning with the application program, as the preceding examples do, files also can be organized to emphasize the departments that use the machine. Figure 4 shows a file system for a machine

```
 1: Jones      Michele   (747) 429-6360  cons chemist
 2: Smith      John      (747) 926-2945  vend furniture
 3: White      Alice     (747) 425-7692  cust accountant
 4: Green      Fred      (541) 926 4921  cust math teach
 5: Black      John      (747) 426 3385  cons mech eng ptg
 6: Smith      Ed        (541) 835 8747  vend caterer
 7: Jones      Alison    (747) 429 5584  cons chem engineer
 8: IBM        sales     (747) 463 2000  vend Dave Hill
 9: Jones      James     (747) 636 3541  cust architect
10: Black      Alice     (747) 426-7145  cust elec eng
```

Figure 1: *A sample telephone list of consultants.*

used by the marketing, manufacturing, and administration departments of a company. The application programs are the same as in the previous examples and are used jointly by all three departments. Because each program is in a subdirectory of its own, any department can use any application just by setting the command search path to the appropriate program.

As much as anything else, the choice of how to organize files depends on how the people who use the computer view their work. If they think primarily in terms of what they're doing ("I do word processing"), the application-based structure might be more comfortable for them. If they think in terms of who they do it for ("I'm the marketing administrative assistant"), the department-based structure might be more appropriate. Neither structure is more efficient than the other; each simply reflects a different way of looking at the file system.

A User-Based File System. If several people use the computer, a file structure that emphasizes the users might be most appropriate, especially if the people use the machine for different applications. Figure 5 shows a directory structure for a system used by three people.

Again, directories are defined for the same application programs used in the other sample file structures. If the computer is used by people with varying degrees of familiarity with DOS, and if not all users need each application, this type of file structure can make the system seem more natural, especially if you create some batch commands that simplify using the directories.

Batch Files

Batch files designed for using directories can be simple or elaborate, depending on who will use them and how much time you want to invest in creating them. Creating separate directories for the people who use the system, for departments, and for application programs simplifies the appearance of the system and makes it easier to keep track of files. Separate directories can, however, also mean that you have to change directories more often. You can automate the use of directories with batch files; this technique makes it simple for all users to work with a structured filing system, even if they are not familiar

Running MS-DOS Van Wolverton
Microsoft Press, 10700 Northup Way
P.O. Box 97200
Bellevue, WA 98009 (206) 828-8080
Copyright: 1984 **Cover Price:** $19.95
ISBN: 0-914-845-07-1

CIRCLE 746 ON READER SERVICE CARD

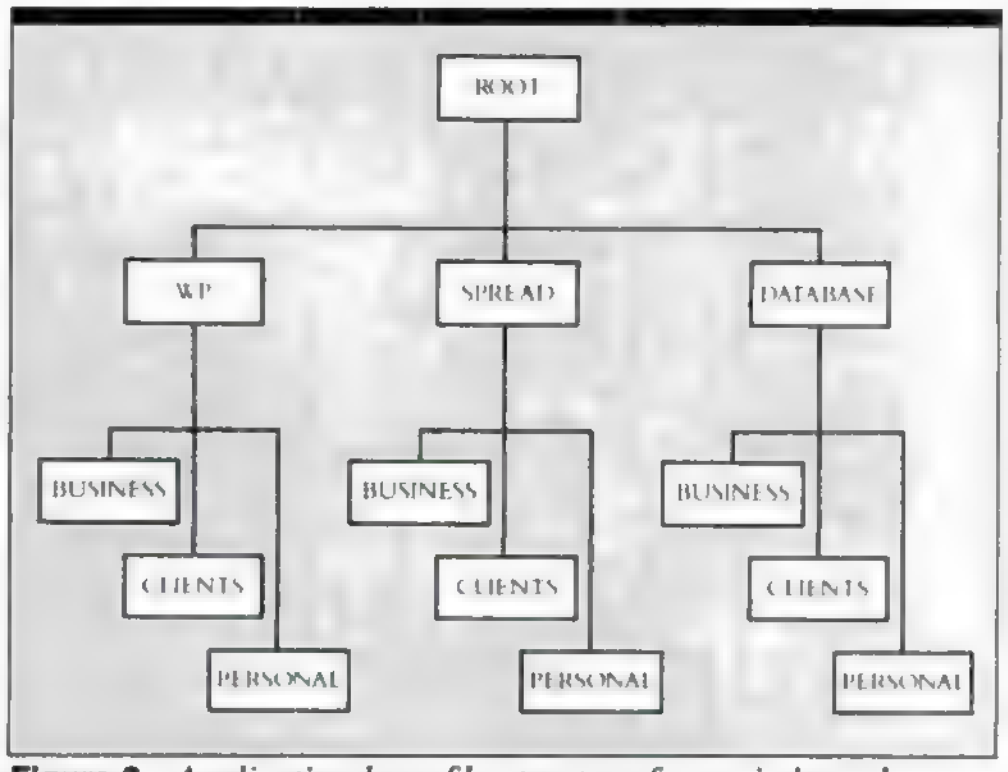


Figure 2: *Application-base file structure for an independent professional.*

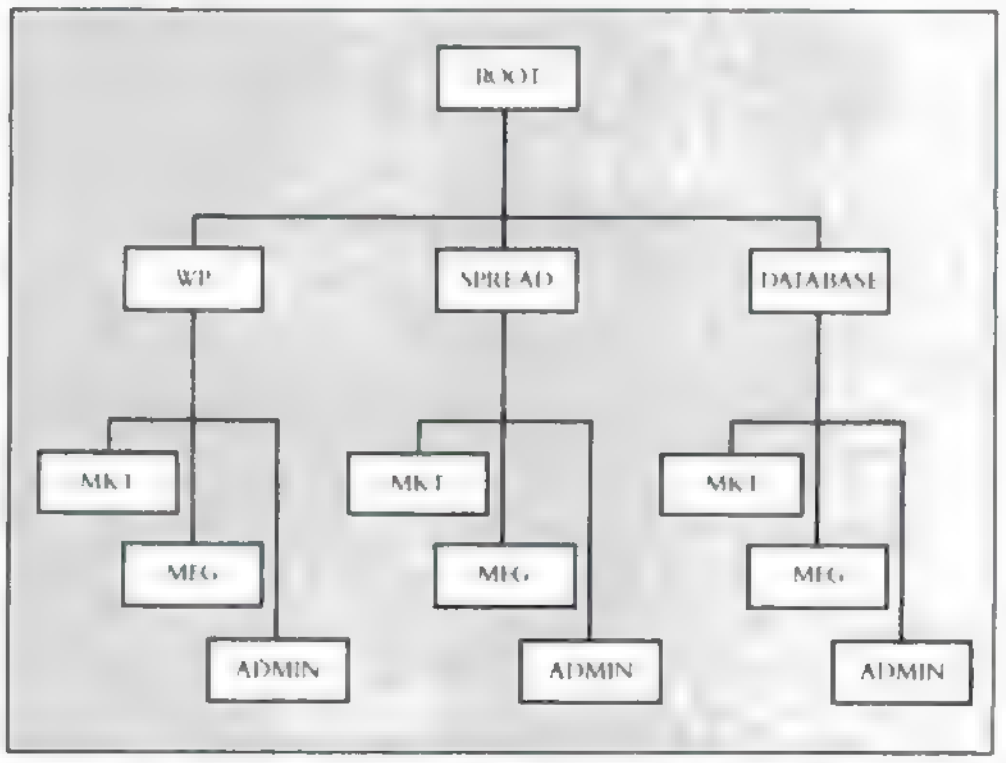


Figure 3: *Application-based file structure for a small business.*

with DOS. If you put the batch files in the root directory and make sure the command search path always includes the root, the batch files for using directories can be accessible from any directory or subdirectory. Switching from one directory and application program to another is always just a matter of typing a single command.

In its simplest form, a batch file to use a directory changes the current directory and sets the command search path. For example, suppose you have the file structure shown in Figure 4, and you want a batch file called WORDMKT.BAT in the root directory to help manage word processing for the marketing department. WORDMKT.BAT could look like the following example (line numbers here and throughout the article are for reference only):

```
1: echo off
2: cd \mkt\wp
3: path \;\programs\wp
```

The Change Directory (CHDIR) command sets the current directory to \MKT\WP, which contains the marketing department's word processing files; the PATH command sets the command path to the root directory (for DOS command files and general-purpose batch files) and to \PROGRAMS\WP (for the word processing program). To use your word processing program with the marketing data files, you would just type WORDMKT.

You could create a similar batch file for each directory that contains data files and then use any directory just by typing the name of the appropriate batch file. Figure 6 shows the directories in Figure 4 that contain data files and indicates how the corresponding batch files might be named.

To produce the other batch files, you simply alter the CHDIR and PATH commands to point to the corresponding directories that contain the data files and application programs. For example, the batch command (SPMFG.BAT) to do spreadsheets for the manufacturing department could contain:

```
1: echo off
2: cd \mfg\spread
3: path \;\programs\spread
```

With these batch files in the root directory, you could type WORDMKT and edit a few marketing department documents, type SPADM and work on some spreadsheets for the administration department, then type DBMFG and update the manufacturing department's inventory database, all without worrying about—or even knowing about—the correct directory. A set of batch files like these makes the multilevel filing system not only more flexible, but also easier to use.

To dress up the appearance of your batch files for using directories, you could clear the screen and display the directory. The CHDIR and PATH commands would be unchanged; this modified version of WORDMKT.BAT would look like the following:

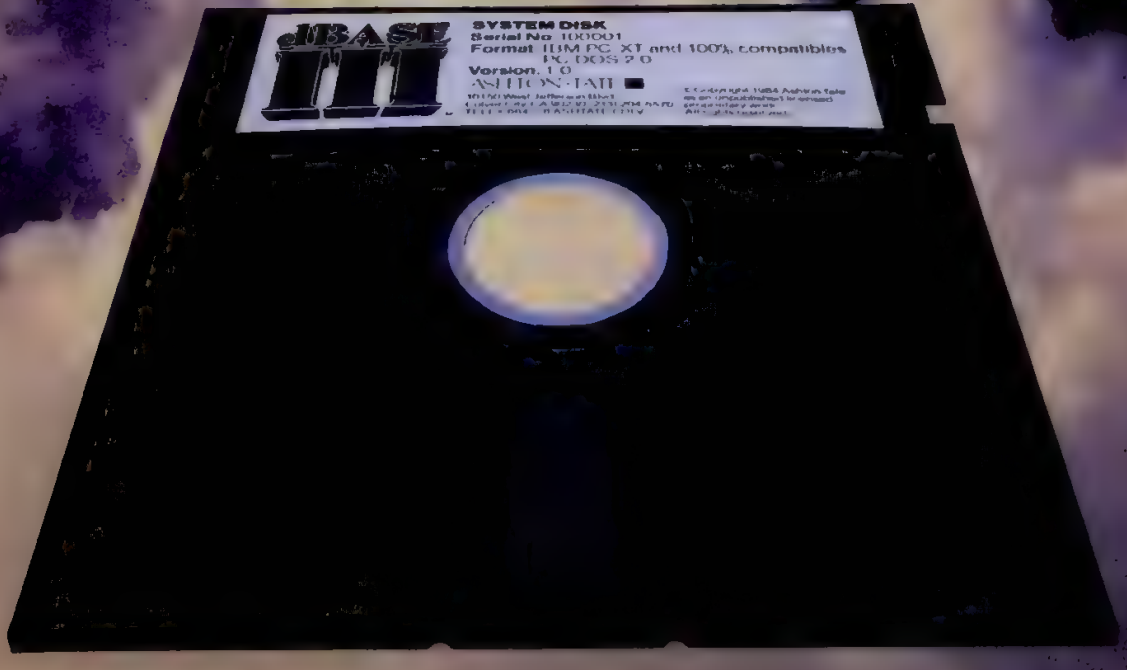
```
1: echo off
2: cd \mkt\wp
3: path \;\programs\wp
4: cls
5: dir /w
```

The /W parameter of the Directory (DIR) command is used here, in case the directory contains more than one screenful of files.

Creating Your Own Menu System

If someone unfamiliar with DOS will be using the system, you can use batch files to create a menu system that quickly moves the less-experienced user to the correct directory. For example, suppose you have the file structure shown in Figure 4; the batch files described here let someone turn on the system and, by typing MKT, see a display like this:

dBASE III


dBASE III
SYSTEM DISK
Serial No 100001
Format IBM PC, XT and 100% compatibles
PC DOS 2.0
Version 1.0

More power to you.



Remember the magic you expected when you first purchased a PC?

It's here.

dBASE III™ is the most powerful database management system ever created for 16-bit microcomputers. It pulls every ounce of energy out of your PC and puts it to work.

On top of that, it's fast and it's easy.

You've never seen anything like it.

dBASE III can handle over a billion records per file, limited only by your computer system. You can have up to ten files open, for sophisticated applications programs.

When you have two related files, information in one can be accessed based upon data in the other.

dBASE III now handles procedures, parameter passing and automatic variables. You can include up to 32 procedures in a single file. With lightning speed. Because once a file is opened, it stays open. And procedures are accessed directly.

Easier than ever.

dBASE III uses powerful yet simple commands that are the next best thing to speaking English.

If you're unsure of a command, HELP will tell you what to ask for.

If you don't know what command comes next, a command assistant does. All you have to know is what you want it to do.

Our new tutorial/manual will have you entering and viewing data in minutes rather than reading for hours.

And to make matters easier, you get a full screen report setup for simple information access.

Faster than no time at all.

dBASE III isn't just fast. It's ultra-fast. Operating. And sorting. Even faster, is no sorting. Because dBASE III keeps your records in order, so you really don't have to sort anything. Unless you want to. Then watch out!

What about dBASE II®?

It's still the world's best database management system for 8-bit computers. And it's still the industry standard for accounting, educational, scientific, financial, business and personal applications.

Tap into our power.

For the name of your nearest authorized dBASE III dealer, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (800) 437-4329, ext. 333. In Colorado, (303) 799-4900.

ASHTON·TATE™

© Ashton-Tate 1984. All rights reserved. dBASE III and Ashton-Tate are trademarks and dBASE II is a registered trademark of Ashton-Tate.

CIRCLE 209 ON READER SERVICE CARD

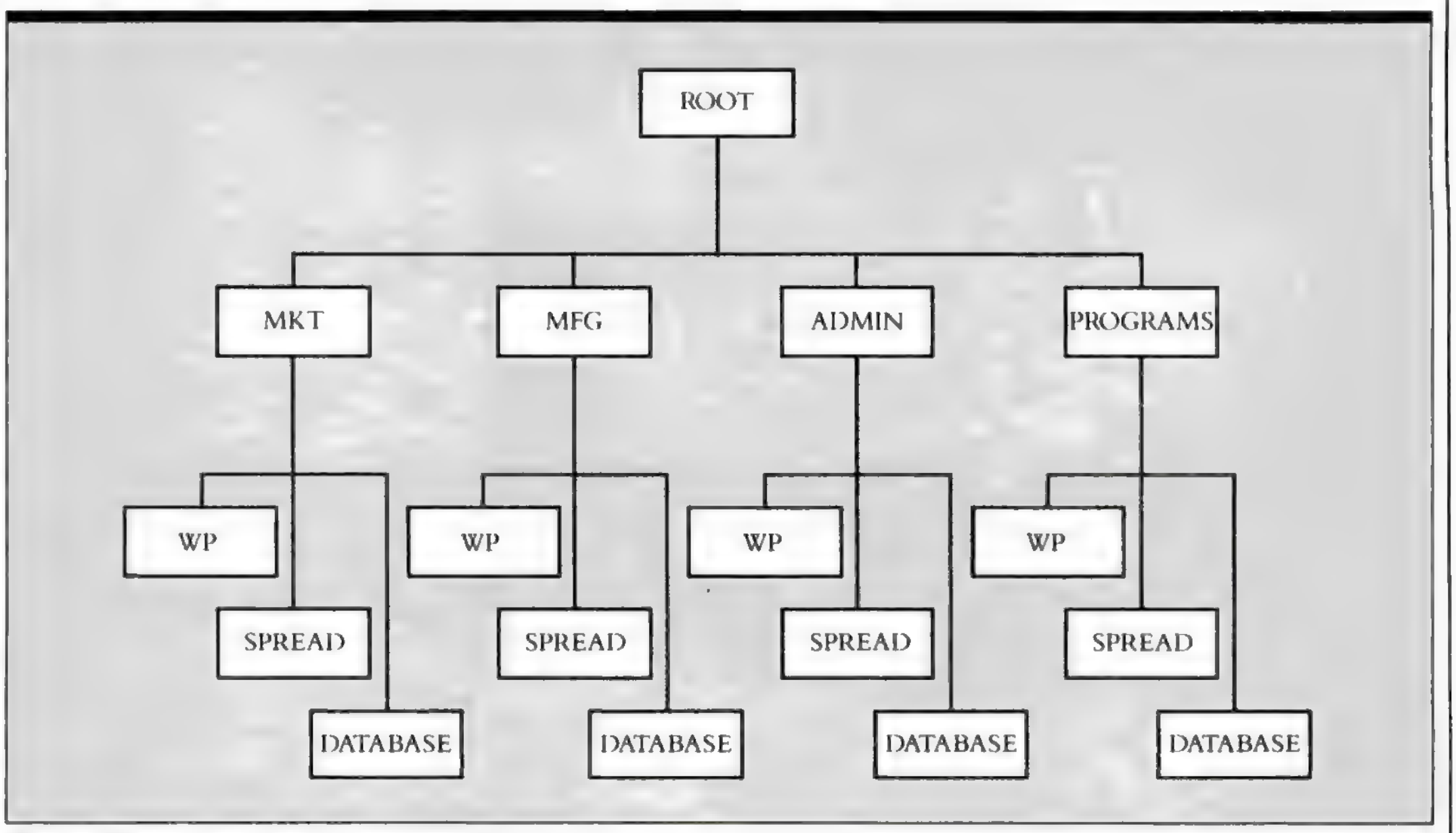


Figure 4: *Department-based file structure.*

```
                        *** MARKETING ***
Applications: Word processing
              Spreadsheet
              Data base
Enter W, S, or D
_
```

If the user types W, the following screen is displayed (the directory entries are hypothetical):

```
                    *** MARKETING_WORD PROCESSING ***
Document files:

 Volume in drive C has no label
 Directory of  C:\mkt\wp

TAXMEMO DOC     THP0315 ...BUDGET  DOC
INVEN01 DOC     SLSLTR...THP0311 DOC
CONFNOT DOC     LETR04  DOC...SLSMEMO DOC
LETR07  DOC     INVEN04 DOC...INVEN02 DOC
SVCREC  DOC     LETR06  DOC...
      23 File(s)   7162384 bytes free

C>_
```

Displays of this kind would require four batch files for each department. For the marketing department, there would be one (MKT.BAT) in the root directory and three (W.BAT, S.BAT, and D.BAT) in \MKT. First, here are the contents of MKT.BAT:

```
1: echo off
2: cd \mkt
3: cls
4: REM THREE TABS AT BEGINNING OF FOLLOWING ECHO
   COMMAND
5: echo <Tab><Tab><Tab>*** MARKETING ***
6: echo
7: echo Applications: Word processing
8: echo                Spreadsheet
9: echo                Data base
10: echo
11: echo Enter W, S, or D
12: prompt $a
```

As you can see, most of the commands are ECHO commands. The batch file is straightforward. It turns off Echo, changes the directory to \MKT, clears the screen, and displays the menu and choices. Then the PROMPT command (described later in this article) makes the system prompt (C>) invisible, so the user sees only the cursor, and the system returns to command level. At this point, MKT.BAT sends you out—even though, as the sample screen display showed, this batch file appears to be waiting for a reply to the prompt Enter W, S, or D.

If the user types W (for word processing), DOS carries out the batch file W.BAT in \MKT. Its contents are

```
1: echo. off
2: cls
3: cd wp
4: path \;\programs\wp
5: REM TWO TABS IN FOLLOWING ECHO COMMAND
6: echo <Tab><Tab>*** MARKETING_WORD PROCESSING ***
7: echo Document files:
8: prompt
9: dir *.doc /w
```

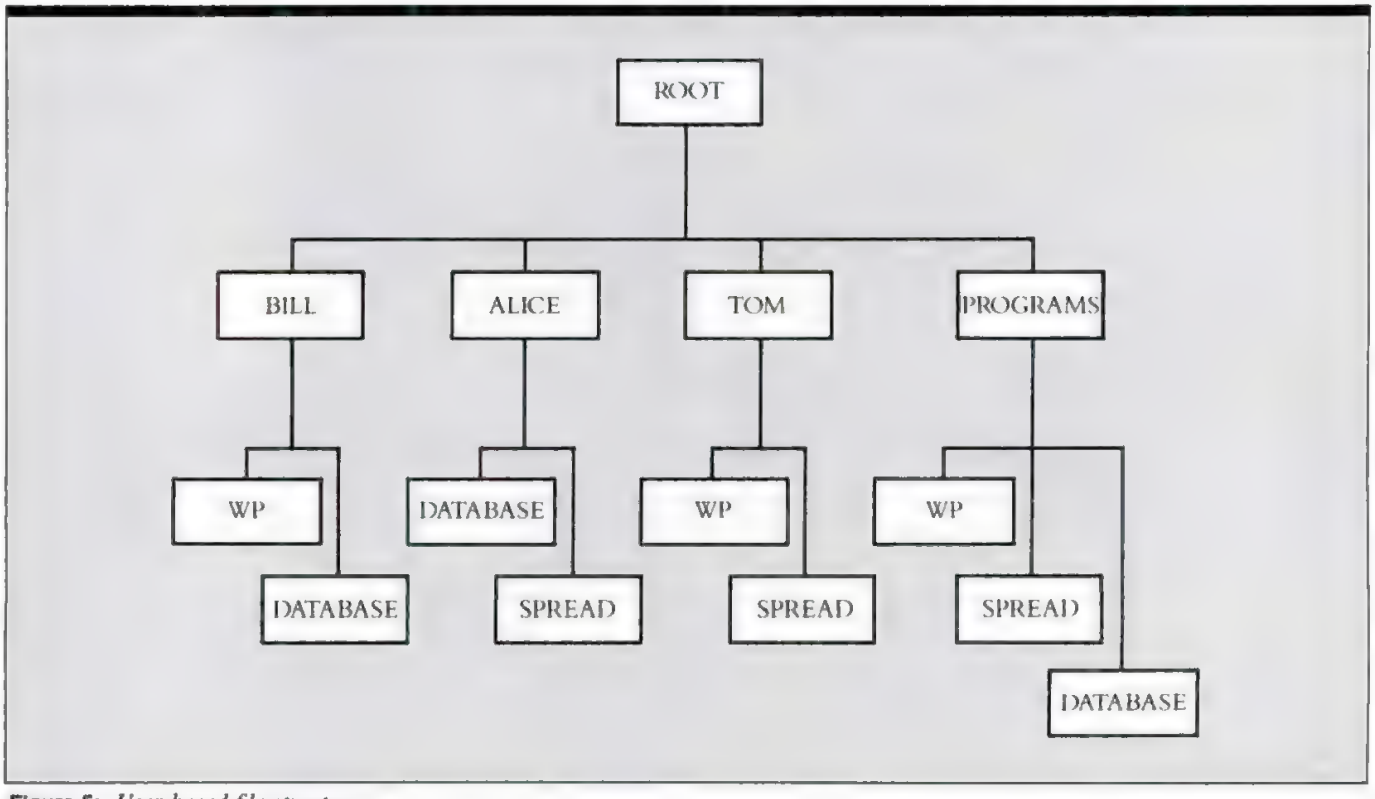


Figure 5: *User-based file structure.*

This batch file produces the sample screen display listing the marketing department word processing files. It, too, is straightforward. It turns the echo off, clears the screen, changes the directory to \MKT\WP, sets the command search path to the root and \PROGRAMS\ WP, displays the titles, resets the system prompt to its normal form, and displays in the wide format the directory entries of all those files with an extension of DOC.

To complete the menu system in \MKT, you need two more batch files similar to W.BAT, one for your spreadsheet and one for your database program. The contents of S.BAT for the spreadsheet are

```
1: echo off
2: cls
3: cd spread
4: path \;\programs\spread
5: REM TWO TABS IN FOLLOWING ECHO COMMAND
6: echo <Tab><Tab>*** MARKETING_SPREADSHEET ***
7: echo Spreadsheet files:
8: prompt
9: dir *.pln /w
```

In the preceding and following lists, the changes from W.BAT are shaded. You can see that the format is the same. In this example, spreadsheet files are given the extension PLN. To complete the menu system, here are the contents of D.BAT:

```
1: echo off
2: cls
3: cd database
4: path \;\programs\database
5: REM TWO TABS IN FOLLOWING ECHO COMMAND
6: echo  Tab  Tab *** MARKETING_DATA BASE ***
7: echo Database files:
8: prompt
9: dir.* dat /w
```

By clearing the screen, displaying your own titles, displaying directory entries, and otherwise controlling the appearance of the system, you can use batch files like these to make the system appear custom-tailored for your own company or department, or even for an individual user. One person who understands how to use the flexibility and power of DOS can make the system easier to use and more productive for everyone else. Batch commands are the key.

Automating Fixed Disk Backup

DOS provides a way to reduce the amount of time required to back up files. (Remember that the BACKUP command applies to Version 2.1 of MS-DOS and to all Version 2 releases of DOS for the IBM personal computers.)

Suppose you have the file structure shown in Figure 4. You decide that each month you should back up all marketing and manufacturing files (all files in \MKT and MFG and their subdirectories) and that each week you should back up all marketing word processing documents (files with an extension of DOC) and manufacturing spreadsheets (files with an exten-

sion of PLN) that have changed since the previous week. You can create two batch files—MNTHBKUP.BAT and WEEKBKUP.BAT—that contain the required BACKUP commands.

```
1: echo off
2: cls
3: echo *** MONTHLY FILE BACKUP ***
4: echo
5: echo Put a formatted diskette in drive A
6: pause
7: backup \mkt a: /s
8: backup \mfg a: /s /a
9: echo LABEL DISKETTEBACKUP FOR <month>
```

The batch file starts by clearing the screen, displaying a title, and instructing the user to put the backup diskette in the A: drive. The first BACKUP command backs up all files from \MKT and all its subdirectories. Any previously existing files on the backup disk are erased. The second BACKUP command backs up all files from \MFG and all its subdirectories, adding them to the files backed up from \MKT.

```
1: echo off
2: cls
3: echo *** WEEKLY DOCUMENT BACKUP ***
4: echo
5: echo Put a formatted diskette in drive A
6: pause
7: backup \mkt\wp\* doc a: /m
8: backup \mfg\spread\* pln a: /m /a
9: echo LABEL DISKETTEBACKUP FOR WEEK BEGINNING <date>
```

Like MNTHBKUP.BAT, WEEKBKUP.BAT starts by clearing the screen, displaying a title, and making sure the correct diskette goes in the A: drive. The first BACKUP command backs up all files with the extension DOC from \MKT\WP that have been modified since the last backup. Any previously existing files on the backup disk are erased. The second BACKUP command backs up all files with the extension PLN from \MFG\SPREAD.

Unless your system is heavily used, only one backup disk per week is required to back up the changed files of both departments. Because the monthly backup copies all files, you can reuse the weekly backup disks in the following month.

With batch files like these, users can back up files without knowing how to use the BACKUP command. All they have to do is type WEEKBKUP once a week and MNTHBKUP once a month and follow the instructions. If you put both batch files in the root directory and set the command search path to the root directory with the PATH command, you or anyone else can use these batch files no matter what the current directory is.

Renaming the FORMAT Command

If you're using a fixed disk, you should note that it's possible to erase all files on the fixed disk by inadvertently formatting it. The scenario goes like this: The fixed disk (drive C:) is the current drive; you want to format a floppy disk, so you put it in drive A: and type FORMAT but forget to add A: to the command. You have told DOS to format the disk in the current drive (the fixed disk). DOS displays its message warning you that formatting the disk erases all files. Believing that the disk to be formatted is the diskette in the A: drive, you press the Enter key. DOS dutifully formats the fixed disk, removing everything that was stored on it.

Directory that Contains Data Files	Directory that Contains Program	Name of Batch File
\MKT\WP	\PROGRAMS\WP	WORDMKT.BAT
\MKT\SPREAD	\PROGRAMS\SPREAD	SPMKT.BAT
\MKT\DATABASE	\PROGRAMS\DATABASE	DBMKT.BAT
\MFG\WP	\PROGRAMS\WP	WORDMFG.BAT
\MFG\SPREAD	\PROGRAMS\SPREAD	SPMFG.BAT
\MFG\DATABASE	\PROGRAMS\DATABASE	DBMKT.BAT
\ADMIN\WP	\PROGRAMS\WP	WORDADM.BAT
\ADMIN\SPREAD	\PROGRAMS\SPREAD	SPADM.BAT
\ADMIN\DATABASE	\PROGRAMS\DATABASE	DBADM.BAT

Figure 6: *Directories and batch files for a department-based file structure.*

Although it's not likely you would make both these errors (forget to type A: and tell DOS to go ahead without checking), the consequences are severe enough that you should consider protecting yourself against the possibility. The technique is fairly simple: rename the FORMAT command file and create a batch file named FORMAT that always formats the disk in the A: drive. The following commands do it (assuming the current directory is the root directory on the fixed disk).

```
C>rename format.com xformat.com
C>copy con format.bat
xformat a: %1 %2 %3
^Z
        1 File(s) copied
```

To format a disk in drive A: with this batch file, you just type FORMAT; there's no chance of formatting the disk in the current drive. To use any parameters of the FORMAT command other than the drive letter, include them with your new FORMAT command. To format a single-sided system disk in the A: drive, for example, you would type FORMAT /S/1.

If you should want to format a disk in a drive other than A:, just enter the FORMAT command with the usual parameters, but remember to type the command as XFORMAT, because you renamed the command file.

Using DOS for Record Management

Although they cannot replace a record- or file-management program, DOS filter commands and batch files can be used to keep track of small- to medium-size files—say, from 50 to 200 entries. This technique is simple and quick, and the price is right: you don't need anything except DOS.

You need this kind of file tracking because as you use the computer, your collection of computer files will grow and grow. If you use a word processor, for example, keeping track

```
          Column
     5        14        23

THP  MFGLET31 10/16/84 Letter to Don Smith about shielding
```

Figure 7: *Word processing index file.*

of all the letters and other documents you create can be a problem. Although using wildcard characters with the DIR command makes a particular file easier to find, you still may have to do some searching to answer such questions as, "How many letters did I write in October to the regional sales office?" or "When did we respond to that request from the National Science Foundation?"

You can solve this problem by creating an index file that describes all your word processing files. You could use the same technique to keep track of any large collection of files.

Figure 7 shows the items of information, and the columns in which they begin, to give you the format for an index file that keeps track of word processing files.

Columns 1 through 3 of Figure 7 contain the initials of the originator of the document (THP). Columns 5 through 12 contain the filename (MFGLET31). All files are assumed to have the same extension. Columns 14 through 21 contain the date the document was created (10/16/84). Columns 23 through 79 contain your description of the document.

Index File Searches

If you keep this index file up to date as you create word processing files, you can quickly find files and answer questions with batch files. You can, for instance, put the DOS FIND and SORT commands in batch files to create your own search commands and achieve some of the capabilities of a simple record-management program.

For example, the simplest search uses the FIND command to display all records that contain a particular string. Create a batch file named SHOW.BAT by typing the following:

```
B>copy con show.bat
echo off
find "%1" ph
^Z
        1 File(s) copied
```

This batch file gives you a SHOW command that displays all records from PH, the phone list of consultants shown in Figure 1, that contain a string you specify as the parameter to your SHOW command. To search the phone list, type SHOW followed by the string. For example, to display all consultants (entries that contain the string "CONS"), type

```
B>showcons
```

DOS displays all entries for consultants.

```
B>echo off

---------- ph
Jones      Michele    (747) 429-6360  cons chemist
Black      John       (747) 426-3385  cons mech eng pkg
Jones      Alison     (747) 429-5584  cons chem engineer
```

This procedure is easier than typing FIND "CONS" PH.

You also can combine FIND commands to search for records that contain various combinations of character strings, such as all consultants named Jones or all entries outside the 747 area code. Putting the FIND commands in a batch file saves even more typing than the SHOW command you just created.

For example, suppose you want to create a command to show all entries that contain both one string and another string. This requires two FIND commands, with the output of the first piped to the second. You could call such a command SHOWAND. Create a file named SHOWAND.BAT by typing the following:

```
B>copy con showand.bat
echo off
find "%1" ph | find "%2"
^Z
        1 File(s) copied
```

This batch command takes two parameters: the two strings the FIND command searches for. Now you can search the phone list for entries that contain two strings just as easily as you can search for entries that contain one string. Just type SHOWAND followed by the two strings. For example, to display all consultants named Jones, type

```
B>showandcons Jones
```

DOS displays the records that contain both strings:

```
B>echo off

Jones      Michele    (747) 429-6360  cons chemist
Jones      Alison     (747) 429-5584  cons chem engineer
```

You can use this technique to answer your earlier questions. For example, to answer the question, "When did we respond to that request from the National Science Foundation?" you would type SHOW NSF. To answer the question, "What letters did I write to the regional sales office in October?" you would type SHOWAND SALES 10/.

Do you want a list of all the documents about the new inventory system, or a list of all letters sent in March? If you keep your index up-to-date, the answers are just a command away.

Simple Bibliographic Index

If your work requires a lot of reading, you're probably frustrated at times by how easy it is to forget where you saw

```
                                Column
          10        19  23              38
          |         |   |               |
WSJournl 10/16/84 18  Smith Don     Copper found in Montana
```

Figure 8: *Bibliographic index file.*

```
                          Column
          10        19        30          43
          |         |         |           |
10/16/84 499 95    Allanthus  H78449002-1  VHS video recorder
```

Figure 9: *Capital inventory index file.*

something. If research is important to your job, but it is not significant enough to justify purchasing and learning to use a database or bibliographic retrieval program, this simple technique might be the answer.

Again, the answer is to create an index file and search it with batch commands. Figure 8 shows the items of information, and the columns in which they begin, to give you the format for an index file that keeps track of magazine articles, books, and other sources of reference material.

Columns 1 through 8 of Figure 8 contain the abbreviated title of the journal, book, or other source. Columns 10 through 17 contain the date of the reference. Columns 19 through 21 contain the page number. Columns 23 through 36 contain the author's name. Columns 38 through 79 contain the title or description of the reference. To answer the question, "Where did I see that article on kinesthesia?" you would type SHOW KINE. To answer the question, "What about that article I saw last June about laser surgery?" you would type SHOWAND 6/ LASER. The time it takes to keep this index up-to-date pays off because you can find valuable information much more quickly.

Capital Inventory

If you're an independent professional or you operate a small business, you could easily have a much larger investment in capital goods than you realize. Your accountant and insurance agent probably emphasize the importance of keeping an up-to-date inventory of capital goods, but it's easy to put off this sort of record keeping.

Figure 9 shows a simple index file that lets you keep track of your capital goods. It's no substitute for a complete inventory system, but it's a start that lets you quickly search and sort your inventory.

Columns 1 through 8 of Figure 9 contain the date of the acquisition. Columns 10 through 17 contain the cost of acquisition. Columns 19 through 28 contain the manufacturer's name. Columns 30 through 41 contain the serial number. Columns 43 through 79 contain the description.

Here, too, you can use batch files to keep track of your inventory with one command. To answer the question, "When did we get the copy machine?" type SHOW COPY. To answer the question, "What did we buy before 1984?" type SHOW ECPT /84.

This technique also can be used to keep track of your personal inventory for insurance purposes; with a bit of modification, it could be used for collections, such as coins, stamps, or first editions.

Occasionally Used Commands

The DOS commands VER, PROMPT, and ASSIGN can be useful in tailoring your system, but you seldom need them.

VER. The Version (VER) command displays the number of the version of DOS you're using. If you use more than one version, or are using someone else's machine, this gives you a quick way to check the version. The VER command has no parameters:

```
ver
```

If you're using Version 2.1 of DOS with an IBM Personal Computer, for example, DOS replies IBM Personal Computer

DOS Version 2.10 in response to the command.

PROMPT. You can change the system prompt with the PROMPT command to display more than the current drive letter. The change takes effect after you enter the command.

The PROMPT command has one parameter:

prompt <string>

The <string> part of the command is a string of character that defines the new system prompt. You can use any characters you wish. You also can cause the new prompt to include one or more items of useful information by including a dollar sign followed by one of the following characters to specify what you want the prompt to contain:

Character	Produces
D	The current date
P	The current directory
N	The current drive
T	The current time
V	The DOS version number
G	A greater-than sign (>)
L	A less-than sign (<)
B	A vertical bar (½)
Q	An equal sign (=)
E	An Escape character
H	A backspace
$	A dollar sign ($)
____	A signal to end the current line and start a new one (the character is an underscore, not a hyphen)

You can use any combination of $ followed by a character that you wish. DOS ignores any combination of $ followed by a character not in the preceding list. You saw an example of this earlier in this article: In the batch file MKT.BAT, the system prompt was set to nothing (make invisible) with the command PROMPT $A.

If you enter the PROMPT command with no parameter (just type PROMPT), DOS restores the prompt to its usual form: the letter of the current drive followed by a greater-than sign (for example, A>).

The PROMPT command takes effect immediately, so it's easy to experiment. Don't be afraid to do so, because all you need do to restore the system prompt to its standard form is type PROMPT.

In the examples that follow, notice how the system prompt changes each time to show the effect of the previous PROMPT command. To leave a blank space between the end of the system prompt and the beginning of the command that you type next, press the space bar before pressing the Enter key to end each command.

To define the system prompt as the current directory (including the current drive), type

```
A>prompt $p

B:\mkt\wp _
```

The example assumes that the current drive is B: and that the directory is \MKT\WP. To define the system prompt as two lines that show the date and time, type

```
B:\mkt\wp prompt $d$_$t

Tue  10-16-84
14:57:03.63 _
```

The time and date will vary depending on how you have set the time and date in your system. Press the Enter key several times; you can see that DOS keeps the time current.

Each user can easily tailor the system prompt to the preferred balance of brevity and information by putting a PROMPT command in a batch file.

ASSIGN. Some application programs require that you put the disks with your data files in one particular drive. This requirement can be inconvenient if you're using a fixed disk. The ASSIGN command gives you a solution: it lets you tell DOS to make a drive letter refer to a different drive (for example, to tell DOS to use the fixed disk, the C: drive, whenever DOS receives a request for drive B:).

Because the ASSIGN command affects all requests for a drive, you should use it with some caution—especially if you are using a fixed disk. Always bear in mind that some DOS commands, such as ERASE, delete existing files from the floppy disk in the specified drive. If you use one of these commands after you have used ASSIGN, you could inadvertently lose valuable programs or data files.

The ASSIGN command has two parameters:

assign <drive1>=<drive2>

The <drive1> parameter is the letter to be assigned to a different drive. The <drive2> parameter is the letter of the drive to be used in place of <drive1>. If you omit both <drive1> and <drive2>, DOS cancels any assignments in effect.

Suppose you have a graphics program that requires all data files to be on the B: drive, but you want to use your fixed disk (drive C:) for data files. To tell DOS to assign all program requests for drive B: to drive C: type ASSIGN B=C.

The assignment affects all requests for the drive, including any commands you enter. If you assign drive B: to drive C: as in the previous example, and then type DIR B:, DOS displays the directory of the fixed disk. The assignment remains in effect until you restart DOS or cancel the assignment by typing ASSIGN. ■

Excerpted from Running MS-DOS *by Van Wolverton,* © *1984, by permission of Microsoft Press, all rights reserved.*

APPLICATIONS



A Casino Puts Its Chips on the PC

1 2 3 4

Resorts International Casino Hotel in Atlantic City is managing its gaming operations with a combination of minicomputers and PCs scattered among the gamblers.

MARTIN PORTER





An operator using a PC on the Resorts International casino floor.

With its mirrored and red-upholstered walls, green-felt tables, and bow-tied dealers and staff, the Resorts International Casino in Atlantic City looks more like a 19th century Western gambling den than a modern link in the chain of gaming establishments and hotels owned by this multinational conglomerate.

But beneath the classic veneer lies enough electronics equipment to put the surveillance capabilities of the FBI to shame. More than 60 IBM PCs comprise part of a complex monitoring and management system. A pair of minicomputers registers every pull of a slot machine's arm and compiles a running total of the millions of dollars won by patrons. Like a Times Square sign, these figures are then emblazoned in lights across one casino wall. Videocameras overhead monitor every move the dealers make.

The PCs are scattered around the casino floor within an arm's reach of every blackjack table, roulette wheel, or crap game. Others are in the casino bank, known as the "cage." The machines have been effectively camouflaged to match the casino's gaudy interior: They are housed in burgundy-lacquered cabinets that shield their Princeton Graphics color monitors from common view and keep their CPUs accessible only to authorized personnel in possession of security clearance and two pass keys.

Computers are no strangers to casinos. The gambling business has always depended on knowing "the numbers"; it has used computers to calculate odds for years. Resorts International is, in fact, the last of the nine casinos in Atlantic City to go on-line at the tables.

> Resorts International wanted pit-side computers that could issue credit markers or complimentary service chits to customers and validate signatures on the scene.

PC Linkup

What is unusual about Resort's configuration is that it uses PCs both as terminals, to monitor the games for the casino's management and the Casino Control Commission (CCC), and as computers, to issue customer credit and distribute chits for complimentary services that range from free drinks, meals, and show tickets to all-expenses-paid junkets. In the process, the PCs are assembling a comprehensive database of "serious" gamblers, and allowing Resorts International to accurately gauge its win and loss records for every table, game, and dealer.

Although most other casinos use minicomputers supporting dumb terminals on the gambling floor, Resorts International data processing director Bill Wacker and a company review committee decided they needed more. They wanted pit-side computers that could issue credit markers or complimentary service chits to customers, validate signatures on the scene, as well as make use of a pair of DEC PDP-11 minicomputers the hotel already owned. The PDP-11s were installed in 1981 to monitor the casino's slot machines. They not only helped the casino maintain the machines mechanically, but developed a picture of slot machine traffic and profitability for the casino management. The minicomputers are hooked up to an inconspicuous microprocessor attached to the side of every slot machine in the house. The system was designed by Bally Systems, the manufacturing arm of the Nevada-based

Bally conglomerate, which is not only the world's biggest maker of slot and pinball machines but also owns casinos around the world.

"Since we already had the Bally system for our slot machines we approached the company to see if we could use the PDP-11s for casino management as well," says Wacker, who worked for IBM's special Atlantic City casino unit before joining Resorts International. "I had an IBM PC at home and was impressed with its flexibility. I started kicking around the idea of using the PC as a super-intelligent terminal. Why not build a board that would let the PC drive a validating printer, a badge reader, produce signature graphics, and tie into the existing system?"

Bally built the needed board and with the help of Wacker and his staff, wrote a software program called the *Casino Management System (CMS)*, using Microsoft BASIC and several assembly routines. Wacker configured each of his PCs with 192K RAM, a Quadram memory board, and a color monitor. They were installed last June and, except for a power outage in early April, have been working 24 hours a day ever since without downtime. "We're probably running those machines harder than anyone other than IBM," Wacker maintains. The PC system is currently used only at Resorts International, but it will likely be re-implemented sometime in 1986 when the company opens a second, 100,000-square-foot, 2,700-slot-machine casino down the boardwalk.

Operation

Wacker has trained the entire casino staff to operate the machines—including the pit bosses who oversee the dealers, pit clerks who input player information, and security and credit officers. Anyone who needs to enter the system is issued a badge resembling a plastic key that is inserted into a Bally badge reader attached to the PC for entry authorization. The system allows varying degrees of authorization to be extended to each badge holder for different system functions.

A Victor validating printer spews out complimentary service chits and credit slips that look like cash register receipts from a supermarket. Credit is a big part of any casino operation—casinos don't want to limit players to gambling only the cash they have on hand. The PC coordinates a credit check as comprehensive as that for a bank loan and permits a credit line to be issued by the casino within 24 hours. Every credit player receives a CMS number and space in the data processing system. In fact, some regulars give their system codes instead of their names when cashing in a credit line.

If the casino extends credit, the information is kept on permanent file. The customer is asked for a signature, which is shipped to the cage and "read" by a special digitizing signature scanner driven by its own PC. The signature appears on the PC screen with every credit readout. The signature scanner is so advanced that several banks are considering using it.

Until the PCs were installed last June, all transactions at the Resorts casino had to be recorded by hand. Customarily, players who drop large amounts of money are approached by a pit boss, asked their names and addresses and evaluated on how long they play, how much they play,

A Micro's Eye on the Bandits

Bally Systems has found a way to use PCs to monitor slot machines for malfunctions and tampering.

The casino management system at Resorts International is only one of several uses for microprocessors in its casino. In fact, the CMS was an outgrowth of an extensive slot machine monitoring system now used throughout the gaming industry, designed by Bally Systems, of Reno, Nevada.

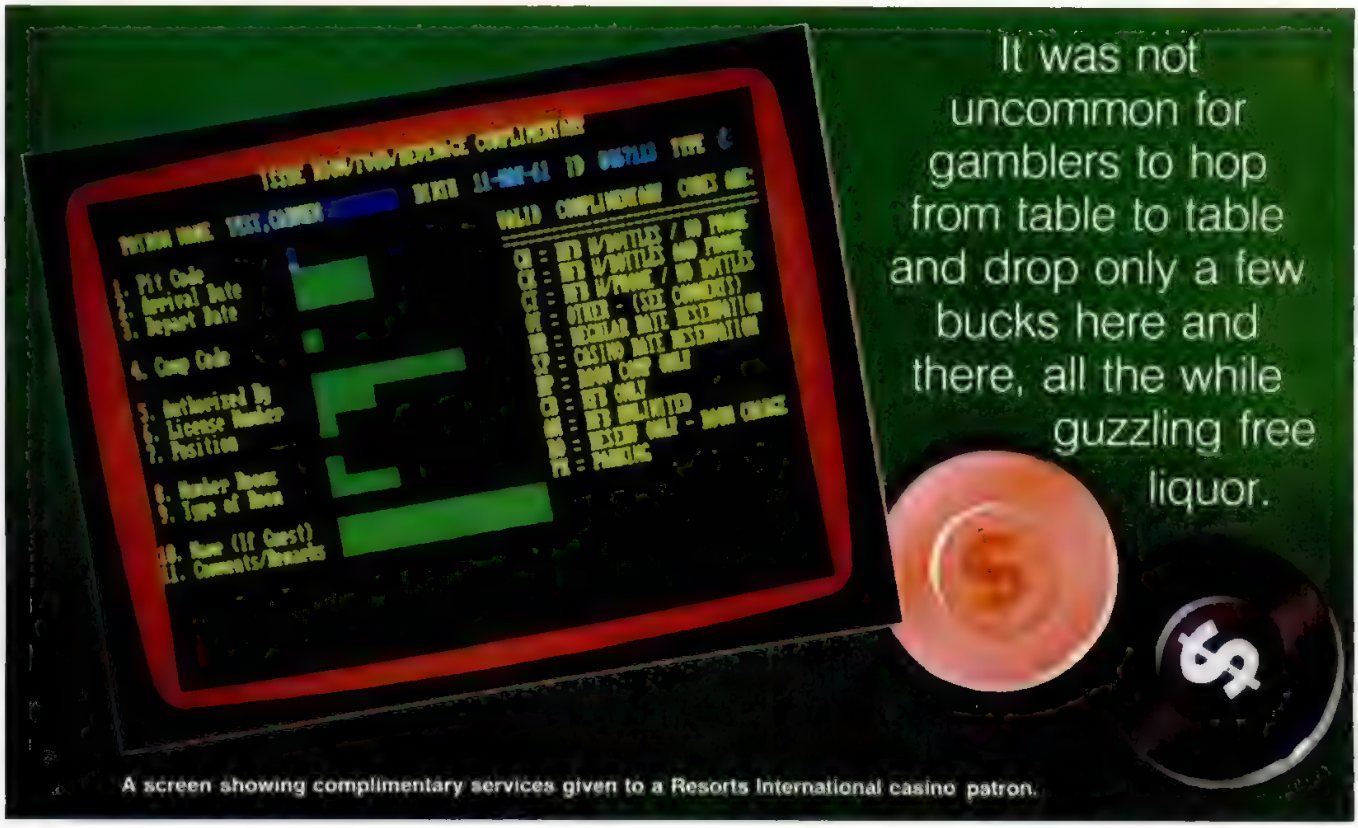
As a mechanical device, the famed one-armed bandits are particularly susceptible to malfunction and tampering. To monitor all the slot machine functions—from every pull of the handle to every jackpot—Bally built a dedicated microprocessor that attaches inconspicuously to its side.

At Resorts International, these black boxes are linked to PDP-11 minicomputers. However, Bally has also devised a similar slot machine management arrangement that can be monitored by the IBM PC.

Bally's Slot Data System V is an off-line slot monitoring system with an internal processor that meters information and then transfers it into a hand-held box. The box sends the information to an IBM PC that can handle up to 4,000 slot machines. This system is designed specifically for the needs of Nevada's roving "route operators" who monitor and service their own slot machines scattered in gas stations and diners throughout the state.

The PC-run system monitors 24 slot machine functions. For example, it registers whether the machine is exceeding its payoff (slots are generally set to pay out 90 percent and hold 10 percent of the money), if the machine is paying off with the wrong combination (two plums, one bell), or if someone is trying to beat the machine.

Tamperers generally either break the machine's lock and then arrange the wheels for a jackpot or use a "yo yo," a coin attached to a string and dipped repeatedly into the slot. Caesar's Palace in Atlantic City reportedly lost a million dollars several years ago after some experts opened the machines and arranged a big payoff. Caesar's has since installed the Bally system throughout its casino.—**M.P.**



A screen showing complimentary services given to a Resorts International casino patron.

and how well they play. (Casinos don't care if you win or lose, they care about how much money you "expose." The odds are in their favor if you "expose" enough.) This information had to be scribbled on a slip of paper and shipped over to the cage. So much paper was traveling from the pit bosses to the credit managers to the bank clerks that the information was impossible for management to track. The PCs have solved that problem.

Complimentary services were another problem. It was not uncommon for gamblers to hop from table to table, dropping only a few bucks here and there, all the while guzzling free liquor, noshing on free hors d'oeuvres, and maybe picking up a ticket to the boxing match in the process. If they moved around enough there was no way to monitor how much money each player was losing and how much of this money the casino was making up to him in "comps." Explains Wacker, "Comps are a marketing tool and you want to be able to monitor them properly. You don't want to hand them out indiscriminately."

The PC doesn't let these "double dippers" fall through the cracks anymore. Pit bosses all over the casino can punch up a player's file at any time and see if his amount of play warrants even another free Martini. The file records a variety of complimentary services—including restaurant meals—as well as information on and an evaluation of the player's last four trips to the tables.

A Huge Database

The result of all this data gathering has been an extensive database of Resorts International's gambling clientele. Of course, not everyone who plunks down money makes it into the system—the cutoff point for how much a registered player must spend varies. The PDP-11s are only equipped to handle information on up to 100,000 gamblers; the data processing staff will soon be purging cash customers from the list to make room for more names. However, the Resorts International management is considering a system expansion to 500,000 names.

To some, this kind of database may smack of Big Brother, but Wacker says that tight security in the data processing department protects customer confidentiality. In fact, the CCC has been carefully reviewing the development of Resorts' computer operation the way it investigates everything in that gambling town—from organized crime to every set of dice and pack of cards that changes hands.

Wacker also says that the system can't shift the odds. However, he admits that the long-term significance of the PC system goes beyond management convenience. It can tell the casino which tables are making money, which are losing, and which players are winners or losers. It might even be able to detect a crooked player or employee.

He describes computer management of gambling as an evolving science, but, he says, "we now have the tools to monitor how Lady Luck makes up her mind." ■

Photograph by: Steven Borns



FEATURES INCLUDE:
16 Bit CPU
With 128K RAM Memory
Expandable to 256K,
Two 320KB Slimline
Disk Drives,
Floppy Disk Controller,
Monochrome Monitor and
Adapter, Parallel and
Serial I/O's.

BEST OF ALL!
TEN DAYS FREE TRIAL!
ALL YOU PAY IS SHIPPING!

FOR MORE DETAILS
CALL OR WRITE
TO: TAVA CORPORATION
16861 Armstrong,
Irvine, California 92714
714/261-0200
Headquarters/Telex: 181667
Answer Back COMPDSHACK IRIN

CIRCLE 375 ON READER SERVICE CARD



IBM® COMPATIBILITY AFFORDABLE PRICE

TAVA PC

THE SMART COMPUTER USER WANTS REAL VALUE WITH IBM COMPATIBILITY!

THE TAVA PC. The ultimate Personal Computer. It gives you IBM PC® Compatibility at a fraction of the cost. Choosing a personal computer is a difficult decision. But, when your decision is a TAVA PC, it's not hard at all! The TAVA PC runs under DOS 1.1, 2.0, CP/M86®, and p-System®. You can choose from a large library of all the most popular IBM PC software products such as dBaseII®, Lotus 1-2-3®, Visicalc® and thousands more.

© TAVA CORPORATION 1983 †California residents add 6% sales tax dBASE II is a registered trademark of ASHTON-TATE Inc. LOTUS 1-2-3 is a registered trademark of Lotus Development
CP/M86 is a registered trademark of Digital Research Inc. UCSDp is a registered trademark of Softech Microsystems IBM PC is a registered trademark of IBM Corp. Visicalc is a registered trademark of Visicorp


SCHOTLAND



APPLICATIONS/JOHN CASE

On the Road to AFRICA

An American packs up his PC and ships it to Gaborone, the capital of Botswana in southern Africa. There he deals with heavy dust, weak power, and his new PC user group.

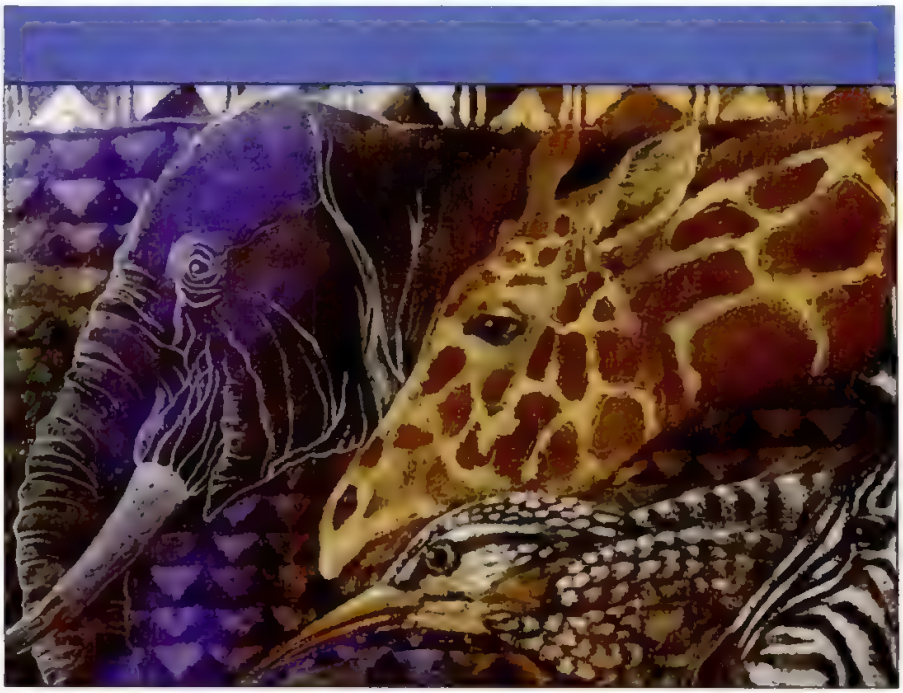
John Case, please call Manica Freight." It was the message I had been waiting for—heralding the arrival in Africa of my IBM PC. I had last seen the machine on a dismal, rainy day in Seattle, and it was now about to arrive in the heat and dust of drought-stricken Gaborone, capital of Botswana. As I set off to collect it, my mind was busy thinking about the many enterprises I had planned for the machine—but Africa is full of surprises. I rushed down to the local freight agents' office only to find that my precious IBM PC had changed identity since I last saw it: from "used personal effects—computer" to "parts of digital data processing equipment." Having been reclassified by South African customs officials, it was now under customs bond. I was not to get the machine into my hands quite yet.

Why take an IBM PC to Africa in the first place? My involvement with Africa dates back approximately 20 years. In the 1960s I joined one of the first Peace Corps groups, went to Africa, and met my wife Sheila, a science teacher from Great Britain. Apart from relatively brief sojourns in England and the States, we have lived in Africa ever since. I taught university and did survey-research studies, simulation modeling, and analytical work related to national development planning.

In 1982 my family and I returned to the United States. I established myself in Washington state's San Juan Islands as an independent microcomputer consultant working with both hardware and software. For use in my consulting work and with a glimmer of an idea that we might return to Africa, I bought an IBM PC.

Return to Africa

For a variety of reasons, after 2 years we did decide that we wanted to return to Africa. Armed with my PC, a technical background, and my experience of how things work in the Third World, I planned to try my hand in the business sector of the southern African economy. Since I had no capital, I intended to carry on as an independent microcomputer consultant doing both hardware and software support for the growing number of microcomputers in Africa. Depending upon potential markets, I also wanted to get into manufacturing. A flexible tool for planning and design, the IBM PC was ideally suited for my needs.



Taking the PC to Africa raised all sorts of questions. How would I get it there? Could it be packed securely enough to withstand the journey? Would any insurer cover it? How would it survive, connected into an erratic 240-volt power supply? What effect would dust have on the disks and drives? Where could I get disks, paper, and printer ribbons?

Figuring it would be better to be safe than sorry, I decided to buy a set of special PC shipping cases to protect the computer on its journey. A few phone calls turned up the information that shipping cases would cost around $500. I ordered a set, calculating wistfully that a similar investment could have bought me 15 boxes of disks or a good compiler.

I knew that there wouldn't be any way of insuring against functional damage in transit, but I felt that I should get some sort of insurance. I had visions of a forklift piercing the side of one of the packing cases. As it turned out, the prices that private insurance companies quoted were so high that it would have been cheaper to purchase a spare computer! I later discovered that air-freight agents carry their own insurance and at very reasonable rates. Unfortunately my machine traveled via air freight for only part of its journey.

The last days before leaving were hectic: handing over my duties as secretary/editor of the local Borderline IBM PC User Group and writing up my last issue of its newsletter, *Bits and Bytes;* copying the User Group's public domain software library; locating spare memory chips; buying disks; informing all the software companies for whom I hold a software license of my change in address (in the unlikely hope that I would be informed of updates); and finally, trying to pack all my equipment in my two new Fiberbilt PC packing cases. The cases were beautiful—they just weren't big enough to hold everything. Careful juggling of computer parts and the rest of the family luggage turned out to be necessary.

The only solution was to pack and ship the PC, its associated cables, some of the manuals, a backup set of my software library, spare printer ribbons, and a few other goodies to keep me going for a while. We carried the original set of my software library together with another backup set, more manuals, parts for a disk drive exerciser, and a few special tools in suitcases or by hand.

Personal Odyssey

In the end, the PC had its own personal odyssey: ferryboat and car from the San Juan Islands to Seattle; regular passenger luggage from Seattle to Prestwick, Scotland; and air freight from Prestwick to Johannesburg, South Africa. Botswana is on the northern border of South Africa and the PC was supposed to travel the rest of the way via air freight. Unfortunately, Murphy's law having worldwide validity, it came by truck from Johannesburg to Gaborone, Botswana, where I live.

Shortly after my arrival in Botswana, I received the first in a series of messages, "Call Emery Air Freight in Johannesburg." I sensed doom. Emery was unable to forward the consignment by air through South Africa to Botswana. It had to be forwarded by "another carrier." This seemed a small enough problem—I was relieved that no malevolent forklifts had been involved. A few days later the "other carrier" called to ask what proportion of the consignment was "used personal effects" and what proportion was "computer." My suspicions that customs problems were on the horizon deepened—but there wasn't anything I could do about it. Although Botswana is an independent African nation and a member of the Organization of African Unity, by necessity it is also a member of a common customs union with the Republic of South Africa, along with both Swaziland and Lesotho.

Finally I received the message that the PC was in Gaborone—In Bond. I wasn't allowed to take home the "parts of digital data processing equipment" because there might be duty to pay. Computers are duty-free but parts of computers are not! I had to use pictures from *PC Magazine* to prove that the monitor, printer, CPU, and keyboard were all parts of the same machine. Finally, 3 days after its arrival and some weeks behind schedule, I was allowed to take possession of my computer.

Since nice, cozy environments for computers are not normally found in Southern Africa, we decided to convert our living room into an office and computer room.

For once I exercised restraint. First I opened the cases and gloated, and then I made a careful check to see that none of the integrated circuits, boards, or plugs had worked loose.

A Tough Life

Nice cozy environments for computers are not normally found in Africa. Until I could get an office, we decided to convert the living room, the largest room in our house, into a combination office, computer room, and electronics workshop. We installed an air conditioner only to find that every time we turned it on the lights dimmed for 2 or 3 seconds. Upon investigation of the electrical system, I discovered that our house was on a three-phase power supply and that one of the phases was virtually unused. Oh joy! (Three-phase power supplies are most unusual in private homes in Botswana.) I quickly installed a completely separate main circuit for the computers (my son also has a microcomputer—a Commodore 64).

The effects of dust on the PC's disks and drives had been one of my most serious concerns. Dust is ubiquitous in many Third World countries, and Botswana is no exception. Most houses have louvered windows and the frames are not carefully sealed. To test the seriousness of the situation, we used the wipe test—clean the desk, wait an hour, and then wipe a finger across it. I have worked in 1-hour wipe-test offices in the past. Fortunately, our living room doesn't have louvered windows, just a huge double-door at one end. Tape and silicone putty around the door frame did the trick: We now have a "24-hour wipe-test" living room.

One problem remained: My PC is a 120-volt, 60-Hz model, while local voltage is 220 volts at 50 Hz. Fortunately I already had a 220-volt to 120-volt transformer and an isolation transformer, both rated at 1,000 watts. I wired both into a computer bench I built out of scraps found at a junk yard. (The difference in line frequency can be ignored unless some kind of timing signal is taken from the line. Luckily, nothing in the PC does so.)

A few days later we were ready to try everything out. I made a quick final check and then switched the machine on. Nothing happened. The bench master switch was off. I turned it on and tried again. The monitor light came on and I could hear the fan. I waited but heard no beep. I tried to remember whether it had taken this long for the PC to perform its internal tests back in the states. Finally a beep and a grind issued from the disk drive. I offered a short prayer of tentative thanksgiving—it works! I found just one problem—an error message indicating that drive A: should be replaced. The problem turned out to be merely a faulty new disk; the drive was fine. My PC had finally arrived.

Computers in Africa

Before coming to Botswana I knew that IBM PCs were being privately imported to South Africa. I also knew that there were

at least three IBM PCs in Zimbabwe, which adjoins Botswana. A search of Gaborone revealed at least seven PCs. IBM had officially started marketing PCs in South Africa during March 1983, a fact that wasn't directly announced in the United States. More recently, IBM authorized an official dealership in Gaborone, to open in the spring of 1984. This will be the first such dealership in an independent black African nation.

The other local IBM PCs are mainly found in big businesses: three accounting and audit firms, two construction companies, and the largest bookstore in the country. The first machine came into the country last October, another one in late December, and the rest since January. Without a doubt, the number of PCs in Botswana will at least double by the end of 1984. After meeting the other users, we all decided to form the Kgalagadi (Kalahari) PC User Group. This is, so far as we know, the first IBM PC user group in an independent black-African nation.

There are nine of us in the group, including one Motswana (a citizen of Botswana). At our first meeting in early March, we raised some of the questions peculiar to our situation: How do we involve our Batswana (citizens of Botswana) colleagues? In what ways might we be of assistance to African users outside Botswana? How can we find out more about the most recent software and where can we get it for a reasonable price? How do we start a literature collection and a public domain software library when we have such difficulty in getting anything? I gave a demonstration of the Norton Utilities and an analysis of South African software price markups using Lotus' *1-2-3*. Since the group is small, I was volunteered to be temporary chairman, secretary, and newsletter producer.

One of the more serious problems our group faces is the wide disparity in levels of education and backgrounds of the members. We have committed ourselves to the involvement of all PC users—but the educational levels range from seventh grade through postgraduate work. The members use PCs for a wide variety of tasks with a fairly definite demarcation between users who carry out professional activities and users who do data entry. A person who can do data entry for a payroll is not necessarily capable of performing a financial analysis using *1-2-3*.

We decided to form the Kgalagadi PC User Group, the first one in an independent black-African nation.



Our members are mainly interested in applications and not in programming. Two of us have extensive programming backgrounds and one member does a bit of BASIC programming and configures *dBASE II* for various applications, but the group's pervasive interest is in what software is available, particularly for business applications, and the relative strengths and weaknesses of the software. Unfortunately our group does not have a wide range of applications software available for evaluation and discussion.

The Next Step

The PC *is* turning out to be an invaluable tool for both consultancy work and feasibility studies. What came as a surprise was the relatively heavy market penetration of microcomputers over a very short period. Just 2 years ago there were only five microcomputer hobbyists in the whole country. Now there are at least six separate businesses selling hardware. Of course, there are still virtually no software or accessories available except for disks and paper, and only one local business has even a modicum of technical expertise. As in the United States many of the salespeople might just as well be selling refrigerators. In a few cases, they are.

The PC and I have gone into partnership with a local Motswana electronics engineer. The PC will perform training and passive solar design analysis. Within the next 3 months we will begin local manufacture and marketing of the *DeSmet C Development Package* for export to neighboring southern African countries. We are also looking for quality software to produce locally under license for distribution in the area. We want to turn a profit, but we also want to emphasize the fact that Third World countries don't have to be left behind.

For the long term, we are beginning to investigate possibilities for local assembly or manufacture of items such as antistatic cleaning compounds, transient-supression devices, stabilized and uninterruptable power supplies, photovoltaic solor panels, and antenna systems for rural satellite communications. The PC is our main design and planning tool, and we would be lost without it. ■

John Case has been working with microcomputers since 1982 and is a founder of Hi-Tech Services, a microcomputer-oriented firm in Gaborone, Botswana.

A Scope —for— Your Micro

Here's the scoop on Infoscope, a database management program with a unique outlook. You don't have to be a master programmer or learn to think like a computer to use it.

Sophisticated database management programs have traditionally emphasized the programming skills required to create and maintain the database. Retrieving data is a less important, rather routine function in these programs. *Infoscope* turns database management upside down by making the revolutionary assumption that your main interest is viewing the data you have entered.

Instead of servicing the computer, *Infoscope* serves the user. The result of this brave experiment is a program with all the classical database functions—but a completely different structure.

The pivotal element in *Infoscope* is the "scope." Scopes are forms you design to input data as well as windows into the database through which you retrieve data. *Infoscope*'s menus help you build data entry scopes, which can be traditional forms with delineated fields or more free-form records. When you want to view data, you can use the same scope with which you entered it or you can design a new scope to look at your data in a different way. A scope can be associated with a specific data file and stored with that file, or stored independently as its own file.

The *Infoscope* workspace is like a large desktop. You can wander all over the workspace (62 lines by 253 columns), creating scopes of different sizes with different characteristics. While one scope contains a list of clients or of events in your calendar, another might contain a new file you are creating. Up to 12 scopes can be active at the same time, and they can be focused on up to 8 files. Different scopes can give you multiple perspectives on the same data, or identical scopes can look at different data files.

The program lets you specify different colors for scopes in order to tell them apart. A small box on the screen graphically depicts your position in the workspace, and you can ask the program for more detailed maps to get an overhead or sideways view of the workspace.

(continued)

ENGINE

Infoscope
Microstuf, Inc.
1845 The Exchange, # 140
Atlanta, GA 30339
(404) 952-0267
List Price: $225
Requires: 192K RAM, two disk drives or one disk drive and a hard disk, PC-DOS, monochrome monitor.

CIRCLE 657 ON READER SERVICE CARD

The Program Generator

Database creation typically involves spending a lot of time using special commands and testing the code you create. Modern database management programs try to make the programming job easier by putting a special overlay called a program generator between you and the database manager. The program generator writes the command language program in response to graphic images you create on the screen.

Infoscope deemphasizes the programming needed to arrange data through the use of an excellent program generator that is always on-line. This program generator does not create code you can review, but the graphic layout clearly describes the fields in every record, the data in the fields, and the relationships among pieces of information.

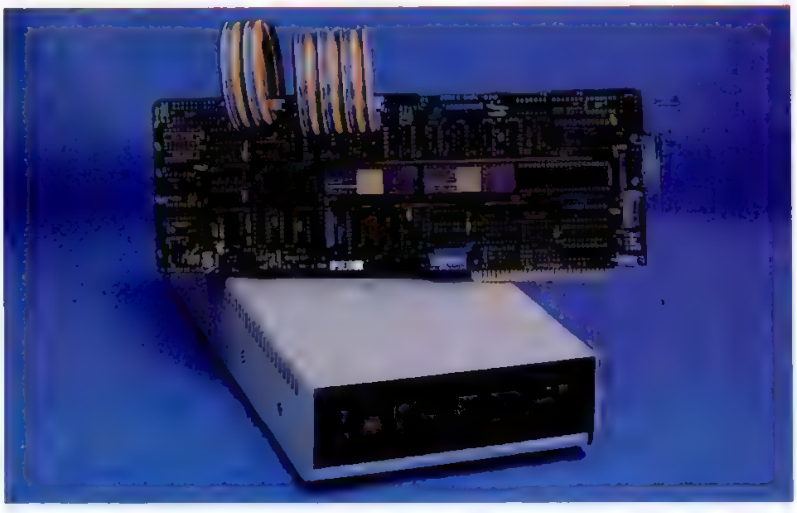
The same screen-driven approach speeds data entry and helps you make changes to both the data itself and the arrangement of the data once it is in the system. You can browse through the records in a file and change their order as quickly as you can enter two or three keystrokes.

Let's examine the database creation process by stepping through a file I actually built with *Infoscope*. I have always meant to catalog the articles I have written over the past 15 years. *Infoscope* has proved to be a perfect tool for creating this kind of database.

When I started to build my database of published articles, I used *Infoscope*'s menu structure to find the CREATE command. *Infoscope* has seven tiers of menus with eight logically grouped commands in each tier. You can either use the spacebar and backspace key to place the cursor over a command or enter the first letter of the command and hit the Return key. Of course, if you know the commands you want to use, you can simply enter their names and skip the menus entirely. *Infoscope* supports several companies' mouse devices, which can also be used to enter commands.

The arrow keys move a standard cursor across the main screen area. If you are issuing a command such as COLOR or RENAME that applies to a particular scope, you move the screen cursor to indicate the scope and the command cursor to indicate the command. The Tab key moves you among the menu layers.

THIS IS IT!



HARD DISK CONTROLLER
or complete SUBSYSTEMS for
IBM® PC and TI® PROFESSIONAL Computers

Whether you use MINISCRIBE, SEAGATE, SHUGART, TANDON, DISKTRON, SYQUEST, MAXTOR or others with ST506 compatible interface, this is the ONLY BOARD you need.

It plugs right into the IBM PC, and features:

- ECC generation/check/correction
- CRC generation/check
- Up to 4 disk drives
- Write-protect each drive individually
- CARTRIDGE CHANGED, CHANGE CARTRIDGE lines are provided to allow use of cartridge type disk drives
- Compatible with 140 Mbyte MAXTOR drive
- Programmable track format: data length is variable from 128 - 1024 bytes/sector
- Data transfer rate 5 Mbits/sec
- Multiple sector transfer
- DMA Data transferring

For IBM PCjr®

Dealer's Inquiries Invited.
Competitive Pricing

HARD DISK SUBSYSTEM AVAILABLE
For more information contact:

ZOBEX

10845-A WHEATLANDS AVE. • SANTEE, CA 92071 • (619) 562-8306

ZOBEX IS A TRADEMARK OF ZOBEX CORPORATION
IBM IS A TRADEMARK OF INTERNATIONAL BUSINESS MACHINES CORPORATION
TI IS A TRADEMARK OF TEXAS INSTRUMENTS CORPORATION

CIRCLE 210 ON READER SERVICE CARD

Infoscope's commands are all logical, descriptive English words. In several cases the program is loaded with different commands that do the same thing, so if you aren't sure of the name of a command, you will probably be successful by guessing. If you don't think the standard commands are descriptive enough, you can add to the list any words in any language you can type on the screen.

Category	Explanation
Character	Text and numbers
Integer	Whole numbers without decimal places
Data	In several different formats
Time	Either 12 (AM PM) or 24-hour format
Stock	Can use fractional formats such as 5½
Category	Selected items checked for spelling
Counter	For part numbers, stock numbers, etc.
Switch	Yes or No responses

Figure 1: *The eight* Infoscope *data entry categories.*

Infoscope will read the commands you enter, and if you make a typing error, the program will suggest a command it knows with a spelling that is close to what you have typed. If you enter new words into the command list, the spelling checker will learn them.

Naming Fields

In building my database, after I selected the CREATE command, the program asked me a series of questions about the data I wanted to enter. First it asked me to name my first data field. I labeled it "Publication."

Infoscope can discriminate among many different types of data (see Figure 1). It will format the characters you enter according to the kind of data you tell it to expect in a field, and it protects you by refusing to enter any data that do not match your specification. Since the Publication field in each record would contain the name of 1 of only 15 publications, I told *Infoscope* to consider this field a "category." *Infoscope* adds items you designate as categories to its vocabulary list and helps you to spell them correctly.

Other fields in my data entry form include the title of the article, a general description of the topic, the number of



Btrieve.™

Network and single-user file management for all your programs. All your programming languages.

Say goodbye to writing file management routines. Because now Btrieve™ can handle file management for all your program development on the IBM PC. All your programming languages.

Based on the b-tree file indexing system, Btrieve provides the most sophisticated file handling powers available for your PC. And for multiple PCs. Btrieve™/N lets you share files among PCs in NetWare,™ PCnet,™ EtherSeries,™ or MultiLink™ networks. And both Btrieve and Btrieve/N offer the same superior performance characteristics:

- Interfaces all major IBM PC languages—BASIC, Pascal, COBOL, C, and IBM Macro Assembler
- Written in 8088 Assembler for the IBM PC
- Multikey access to records
- Automatic file recovery on system crash.

Btrieve and Btrieve/N also have user-defined transaction management. Unlimited number of records per file. Complete error control and recovery within an application. Duplicate, modifiable, and segmented keys. Variable cache buffer from 16K bytes to 64K bytes.

Moreover, record retrieval is *fast* with Btrieve—no matter how large your data base. So *you* can begin writing programs *faster* with Btrieve.

Say goodbye to file management routines. And hello to Btrieve.

SoftCraft Inc.

P. O. Box 9802 #590 Austin, Texas 78766 (512) 346-8380

Suggested retail prices: Btrieve, $245; Btrieve/N, $595. Requires PC/DOS or MS™/DOS, version 1 or 2. Dealer inquiries welcome.

IBM, MS, Btrieve and Btrieve/N, PCnet, MultiLink, NetWare, and EtherSeries are trademarks of International Business Machines, Microsoft Corporation, SoftCraft Inc., Orchid Technology, Davong Systems Inc., Novell Data Systems, and 3Com Corp., respectively.

CIRCLE 452 ON READER SERVICE CARD

pages, and the date of publication. *Infoscope* is particularly flexible in handling dates. You can enter them in several ways, such as May 2, 1984, or 5/2/84. The program understands these different formats and can effectively sort mixed entries according to the dates you supply.

Once you have defined the way the information in the database is to be arranged, you have to be able to enter your data quickly and efficiently. Equally important, however, is the ability to update information in the database or to add new fields to every record. An inflexible electronic database may be worse than no electronic database at all. The *Infoscope* graphics program generator allows you to make changes to the structure of your data or to individual records at any time. You can even have different versions of the same form active at the same time.



This scope is looking at a data file called ARTICLES. The focus has been narrowed so that only records with PC in the publication field are displayed. The records are sorted according to their dates. You would have to scroll the screen with the arrow keys to read the subjects that run off to the right. The menu at the bottom of the screen is ready for selection. The small box in the bottom right-hand corner shows where you are working in the total available field.

The Main Event

Infoscope does a good job of helping you design the database and getting the information into the computer, but its strength is the speed and flexibility it gives you in retrieving information. You can get at information with the same scope you used to enter it, but you probably only want to see specific records. The FOCUS command helps you select just the information you want to see from your file.

The FOCUS command has over 40 specifications, which are descriptive words that allow you to select records in a file, such as *equals*, *includes*, *larger*, *smaller*, *or*, *not*, and *is*.

For example, if I want to see all the articles I've written on data communications for *PC Magazine* in 1983, I would type:

```
FOCUS Publication is "PC" and
Date has "1983" and Subject
is "communications"
```

The program would sort through the data file and only display the records meeting those criteria. This command description is logical and simple to construct, but the unique aspect of *Infoscope* is that these are not the only words that will give exactly the same results. Here are some other command lines that will retrieve the same data:

```
FOCUS Publication equals
#PC" and Date ends "83"
and Subject contains
"communications"
```

or

```
FOCUS Publication = "PC" and
Date includes "1983" and
Subject has "communications"
```

Words or symbols such as *is*, *equals*, =, *same*, and *be* all have the same meaning and can be mixed with many other words to describe the information you want.

Conditions you can use with the FOCUS command allow you to add a different criterion to a command line you have already entered or ignore a certain portion of a command in the system. The program will even look for a close match for a name or word in a field you specify in a FOCUS command. You can type in a command line such as

```
FOCUS name SOUNDS "Freed"
```

and the program will look in the Name field for words that have the same first letter and other similar characteristics.

After you have created a focus, the scope you are working with will display the records in the file that meet the criteria. If there are more than a few records in the scope, you can use the PgUp and PgDn keys to scroll through them. With the SORT command, you can sort the records in the scope in ascending and descending numeric or alphabetic order in the field you specify. You can find specific records among the records that you have already focused and sorted by specifying a criterion, for example: for a specific field

```
FIND NAME = "Charles M.
Russell".
```

In my article's database, when I am interested only in the number of articles pub-

lished within a certain period of time in a certain magazine, I can ask the program to count the number of records meeting a focus specification or even to average the number of pages shown in the Length field.

Once I have used FOCUS to describe the records I want to see in a scope, I might decide that I need to see only the title and date of each article. I can use the HIDE command to eliminate the fields I don't want from view or the SHOW command to display only those fields I am interested in. In every case, the response to an *Infoscope* query is very fast.

Ad Hoc Queries

If you want a specific retrieval on a regular basis, such as a monthly listing of new employees, you can describe the criteria for retrieval and save them in the *Infoscope* command language so you can run the query quickly and consistently each month as a standard report. You can print the resulting report in a standard format with each item arranged the way you want it and appropriately labeled. You also have the option of stringing single reports together into a standard package.

A one-time or infrequent retrieval is termed an "ad hoc" request. Ad hoc requests are best handled through *Infoscope*'s query language, a subset of the full command language. Query languages that allow you to state your needs quickly and simply are a new and highly publicized feature of many mainframe and microcomputer database management systems. Responses to ad hoc requests are often poorly formatted and labeled, but that is usually considered part of the price you pay for fast and informal retrievals.

Here *Infoscope* has once again turned things upside down. While it produces standardized reports as well as the next database program, its emphasis is on giving you the ability to make quick and well-formatted ad hoc queries.

The query language contains multiple redundant commands that are common English words. If you want to see all the data in a file, for instance, you could type ALL, EVERYTHING, or ANYTHING and get the same results under most conditions. If you find those words hard to remember, you can add other words and equate them to *Infoscope*'s original commands. This feature can also be used to customize *Infoscope* for languages other than English. The ability to use several different words to accomplish the same task makes the program work much like humans work.

When you want to print out the information you have focused on, the PRINT command allows you to print the records contained in a particular scope. You can print the scope with or without the headings, and if your printer is capable of printing different fonts, *Infoscope* will allow you to use different fonts for the name of the scope, the focus specification, the sort specification, the header area, and the data area.

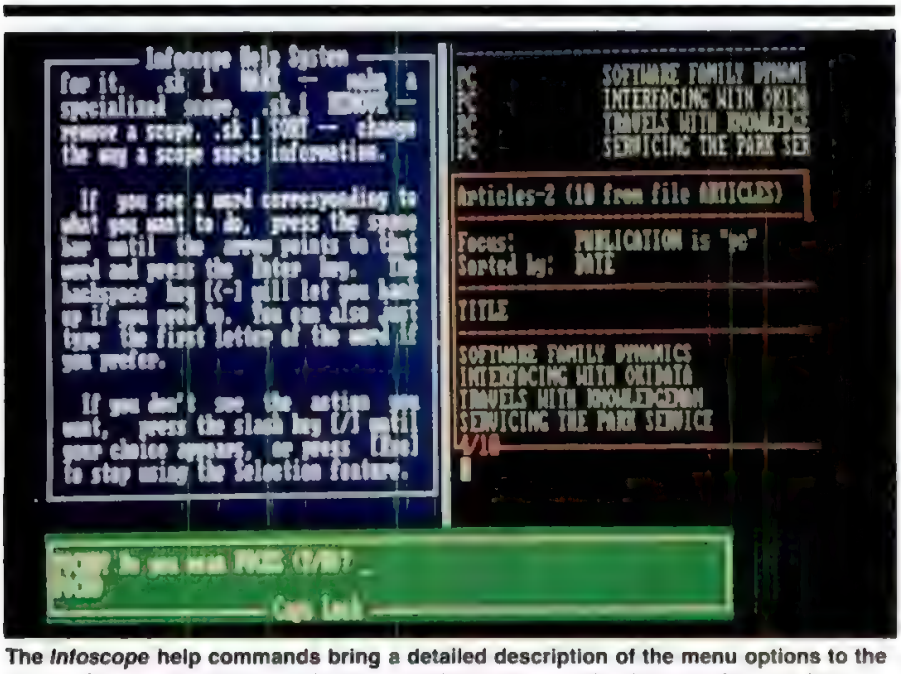
But simply printing out the focused data with pretty fonts does not produce the professional-looking reports you want to put in front of your boss or client. The *Infoscope* REPORT command allows you to set up borders, page numbers, headers, footers, and other formatting criteria. Since you don't want to recreate these factors each time you make a report, the program will save the report format. Once you have created the format, even people who have never used *Infoscope* can print standard reports from the current data in the file.

Finishing Touches

Infoscope has some interesting extras. One relatively unique feature is the ability to simultaneously enter data into multiple files. The program can also make simultaneous queries to different files or multiple queries to the same files using different criteria.

Another nice touch lets you help inexperienced users work with the program. You can create a command file that sets up the program and asks for specific keyboard inputs. Such a command file lets *Infoscope* practically run itself, and anyone can easily update a file, enter new data, or retrieve information.

Even a program as understanding as *Infoscope* can be confusing if you don't



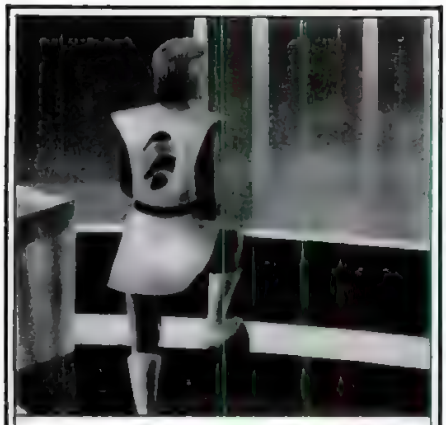
The *Infoscope* help commands bring a detailed description of the menu options to the screen. You can hold this explanation on the screen or wipe it away after you have read it.



4401 South Tamarac Parkway, Denver, CO 80237—Customer Service 303/741-1778

Apparat retail outlets—DENVER: 4401 S. Tamarac Pkwy. 303/771-2032 • 5224 W. Warren Ave. 303/985-1217

CHICAGO: 1844 S. Arlington Heights Rd. 312/640-0322



Imagine your PC with Apparat add-ons. Imagine where it could take you.

Special values from the hard disk experts. For example, imagine your IBM PC or Portable PC with hard disk capability. Apparat's external Hard Disk Subsystem is completely compatible, running DOS 2.0 or 2.1 without modification or device drivers. And now you can get more capacity—22 and 33 MB formatted configurations—for less money. 22 MB for **$2,295,** 33 MB for **$2,995.** Apparat also offers internal or external 10 MB drives at similarly low prices.

XT owners—trade in your 10 MB drive for a larger Apparat hard disk drive. Our 22 MB drive is **$1,299,** but you pay just **$899** with a trade-in of your existing 10 MB drive. Our 33 MB drive is just **$1,799,** but you pay just **$1,399** when you trade in your existing 10 MB drive. Call the Apparat ordering hotline for trade-in details and shipping instructions.

TEAC or Panasonic floppies. These half-height floppies are perfect for your PC, PPC, or XT. Call for trade-in prices on full-height floppies.

New 28 pin EPROM programmer. Now Apparat has a new Prom Blaster for the PC, XT, PPC and PCjr to program most 28 pin EPROMS (including the 2764, 128, 256), in addition to our original Prom Blaster that programs most 24 pin EPROMS ...each **$129.** We also make an EPROM cartridge for the PCjr to accept your newly programmed EPROMS.

PPC and PCjr. Apparat has developed new products for the IBM Portable PC. Now available is a 256K RAM card and a Combo card (P & S). Both fit the PPC short slots. New for the PCjr is a 128K RAM card and a Combo jr card (P & clk). Both fit the side attachment.

Other Apparat add-ons. RAM cards for the PC and XT—64K **$189,** expandable to 512K. COMBO II card for the PC and XT, 5 functions on one card—**$189.** CRAMBO card for the PC piggybacks COMBO II on 64K RAM card—**$359.** 64K internal PRINT SPOOLER with parallel interface—**$299.** Stand-alone at **$319.**

Warranty. All Apparat manufactured P.C. boards sold after June 1, 1984 covered by our exclusive lifetime limited warranty covering parts and labor.

Apparat, Inc.

ADD ON AND ON AND ON AND ON AND ON

ORDERING AND DEALER INFORMATION

800/525-7674

Prices subject to change without notice

CIRCLE 102 ON READER SERVICE CARD

Infoscope's Human Instincts

The people behind Microstuf's new database manager talk about the program and its development.

When you mention the name Jeff Garbers to professionals in the microcomputer industry, many of them draw a blank. But when you say, "You know, the tall guy at COMDEX," they almost all know who you mean. Garbers, 6 foot 9 inches, has a real advantage in the crowded aisles at computer trade shows.

Garbers is the author of *Infoscope*. He worked closely in the production of the program with Les Freed, the president of Microstuf, Inc. Garbers and Freed also worked together on the latest version of *Crosstalk*, the popular data communications program that Microstuf has marketed since 1978.

Both believe that the human factors involved in computer software are just as important as the more technical aspects of programming. Garbers left a Ph.D. program in computer science at Georgia Tech because it focused on the theoretical aspects of programming as opposed to the human view. In developing *Infoscope* he worked closely with one of the recognized experts in the field of human factors, Dr. Albert Badre.

Human Interest

"The computer does not end at the terminal," says Garbers. He claims that he has tried to give the program the ability to understand commands in human terms instead of imposing computer-like thinking on people.

Infoscope wasn't ready for its initially announced release date of August 1983. However, Garbers and Freed stress that the mature program now on the market met and surpassed its design goals.

According to Garbers, "The release of the program was delayed because we were pushing our programming tools to their limits. *Infoscope* is made up of over 80 assembly language modules, and we used up the full capacity of the linker to put them together. We kept trying to cram in just one more thing.

"Making the help messages sensitive to the context of the work on the screen was a detailed chore. But when you ask *Infoscope* for help it gives you more than a generalized response. It looks at what you are working on and tries to give you a really meaningful response."

Garbers' study and consultations on people's perceptions of software show that they feel better about programs that they can personalize to match their own style of work. The capabilities Garbers has put into *Infoscope* allow a person who is relatively unfamiliar with either the program or computers to change many things: the color of the screen, the way commands are displayed, and even the way the computer system talks to the user. Changing styles of presentation and operation give a person a feeling of mastery over the program that extends to the more difficult tasks.

Garbers and Freed both criticize rigid menu structures. *Crosstalk* and *Infoscope* have command systems that allow you to either enter a command directly or select from a menu. Garbers says, "There is a lot more to ease of use than counting keystrokes. The time the task takes and the number of cognitive steps involved are bigger parts of the equation. *Infoscope* lets you link together cognitive steps, like the criteria in the FOCUS command, so they make sense. We think this is better than breaking up operations in ways that only make sense to computers." —**F.J.D.**

TOTAL CONTROL:
PC/FORTH™

Compiles with the New 83-Standard

GRAPHICS • GAMES • COMMUNICATIONS • ROBOTICS
DATA ACQUISITION • PROCESS CONTROL

- **PC/FORTH™**: interactive and conversational, but 20 times faster than BASIC.
- **PC/FORTH™** programs: highly structured, modular, easy to maintain.
- **PC FORTH™**: direct control over all interrupts, memory locations, and i/o ports.
- **PC/FORTH™**:full access to DOS files and functions.
- **PC/FORTH™** application programs can be compiled into turnkey COM files and distributed with no license fee.
- **PC/FORTH™** Cross Compilers available for ROM'ed or disk based applications on most microprocessors.
- **PC/FORTH™**: compatible with PC/XT, COMPAQ, and all hard disks.
- **PC/FORTH™**: for PC-DOS 1.1 and 2.0, CP/M-86®, Concurrent CP/M.

PC/FORTH™ **$100.00**
Includes interpreter/compiler with virtual memory and background multi-tasking, full screen editor. Assembler,utilities, 200-page technical manual. Upgrade to PC/FORTH+ available.

PC/FORTH+™ **$250.00**
Allows creation of FORTH programs up to 1 megabyte in size.

DEMO DISK **$5.00**
Requires graphics card.

Extension Packages

Forth Cross Compiler	$300.00
Advanced Color Graphics	$100.00
Intel 8087 Support	$100.00
Software Floating Point	$100.00
Interactive Symbolic Debugger	$100.00
PC/GEN™ Custom Character Sets	$ 50.00
PC/TERM for Smartmodem	$ 60.00
QTF+ Editor/Text Formatter	$100.00
Curry FORTH Programming Aids	$150.00
Cross Reference Utility	$ 25.00
B+ Tree Index Manager	$125.00
B+ Tree File and Index Manager	$200.00
Intel 8087 Processor	$200.00
"Starting FORTH" Tutorial	$ 16.00

Trademarks: IBM, International Business Machines Corp.; CP/M, Digital Research Inc.; PC/Forth+ and PC/GEN, Laboratory Microsystems Inc.

VISA LMI MasterCard

Laboratory Microsystems Incorporated
Post Office Box 10430, Marina del Rey, CA 90295
Phone credit card orders to ***(213) 306-7412***

CIRCLE 276 ON READER SERVICE CARD

CopyWrite backs up all IBM PC Software.

There are no exceptions. Copy-protected software is copied readily. **CopyWrite** needs no complicated parameters.

Requirements:

IBM Personal Computer or XT.
64k bytes of memory.
one diskette drive.
CopyWrite will run faster with more memory or another drive.

CopyWrite is revised monthly, to keep up with the latest in copy protection. You may get a new edition at any time for a $12 trade in fee.

CopyWrite is available at a price of $50 US funds from:

Quaid Software Limited
620 Jarvis Street, Suite 2412
Toronto, Ontario, Canada M4Y 2R8
Telephone (416) 961-8243

CIRCLE 158 ON READER SERVICE CARD

INFOSCOPE

know where to start. *Infoscope* comes with a large file of helpful explanations you can call from the screen, a good manual, and an excellent tutorial. The on-line explanations are keyed to the commands

Analyze the size of your database before you commit yourself to a RAM-limited database manager.

you are working with when you ask for help. Each explanation lets you move through several levels of detail. I used a draft of the manual, which contained good explanations, examples, and lists of commands. The *Infoscope* tutorial combines a self-running program with opportunities for you to make your own inputs and changes to the data. The tutorial is probably the fastest and certainly the most rewarding method of learning how to use the program, but if you prefer you can work through the menus and information screens.

Infoscope's speed and user interface take their toll in system capacity. The program's major limitation is that everything must reside in RAM, so the amount of data you can manipulate is restricted by the amount of RAM you have. This limits *Infoscope*'s usefulness to applications in which the data are broken into many separate files or in which only one file of moderate size is used. You must carefully analyze the size of your database before you commit yourself to a RAM-limited database manager.

If you can live with limited RAM, *Infoscope* is an appealing program. Easy for inexperienced users to learn but complex enough to interest technophiles, this fast and flexible database manager has something for everyone. ■

COBOL with a Personal Touch

The Personal COBOL package offers a COBOL subset for programmers who prefer using the PC.

Seizing upon the trend toward integrated software, the folks at Micro Focus, Inc., have produced a multifunctional COBOL development environment for the IBM PC. Personal COBOL is flexible and powerful enough to interest not only PC applications developers, but also the increasing number of mainframe COBOL programmers who use the PC to produce initial source code.

The Personal COBOL package contains a program editor, syntax checker, COBOL interpreter (called the Animator), and a nifty forms-painting facility that produces screen-handling source code. A separate compiler (see sidebar) is available at additional cost. The software comes on a systems disk and an example disk, along with a reference manual, operating guide, and introductory primer.

Personal COBOL
Micro Focus, Inc.
2465 E. Bayshore Rd., #400
Palo Alto, CA 94303
(415) 856-4161
List Price: $395
Requires: 256K RAM; two disk drives or a hard disk.

CIRCLE 658 ON READER SERVICE CARD

Two major audiences will be attracted to the Personal COBOL package. The first is composed of individuals writing commercial applications for use on the IBM PC. COBOL has long been the language of choice for writing accounting, inventory, sales, and other business software. Personal COBOL is a fine tool for the software developer who wishes to produce high-quality work, because so much of the testing and debugging is simplified by the Animator. The tested source code can then be compiled by using the separate Level-II compiler for distribution.

The second audience for Personal COBOL is the growing legion of mainframe programmers who find it convenient to write their programs on a personal computer and then upload the tested source code to the big machine. PCs are already replacing dumb terminals at many large companies. As this trend continues, the efficiency and ease of use afforded by interactive program development tools will become increasingly important. Micro Focus has made a terrific contribution to this process, and Personal COBOL deserves serious consideration by individual and corporate software developers.

The COBOL Subset

Personal COBOL is actually a subset of Micro Focus' Level-II COBOL compiler (see sidebar), which is a full implementation of the 1974 Federal High-Level ANSI

COBOL standard. The COBOL nucleus is augmented with modules for table and file handling, sort-merge, segmentation, library usage, linkage, communications, and debugging. If you're an experienced COBOL programmer, you'll immediately feel comfortable with the scope of this subset since most of your favorite features are probably there.

My only major peeve is Personal COBOL's lack of the COBOL Report Writer feature.

Personal COBOL does have some extensions to standard COBOL, but a few standard features are missing. The most important extensions were added in order to make full use of the IBM PC. Thus, you can code clauses in the Special-Names paragraph of the Environment Division to assign mnemonics to the keyboard (SYSIN), the crt screen (SYSOUT), and to printer functions (formfeed, tab). If you declare CONSOLE IS CRT, you can then use the extended Accept/Display syntax to control screen input/output. You can even capture the cursor address during an accept operation.

The Personal COBOL subset supports indexed, sequential, relative, and line-sequential (text) file organizations. All the familiar data representations are available. In addition, you can express a hexadecimal value in a nonnumeric literal by coding "X 'nn'," where 'n' is a hex digit. The Procedure Division hosts just about every verb you'd ever think of using, as well as one you should religiously avoid (the dreaded ALTER verb). I happen to like the STRING, UNSTRING, and INSPECT verbs, all of which are happily included. Alas, this implementation left out EXHIBIT, which I find useful for debugging. Micro Focus no doubt felt it unnecessary, given the built-in debugging power of the Personal COBOL package.

Micro Focus has customized Personal COBOL to fully utilize the IBM PC keyboard. The function keys can do triple duty, depending on whether they are pressed by themselves or in conjunction with the Alt or Ctrl key. In general, function keys alone perform the major tasks appropriate to the work you're doing, whether it is editing, checking, or executing a program. The Alt key redirects the function keys to perform library tasks, such as loading and saving text and forms. Finally, the Ctrl key allows the function keys to perform cursor and screen control tasks, including scrolling. The system displays the meaning of each function key at the bottom of the screen. If they aren't clear enough for you, press the friendly F1 key for Personal COBOL's help screens, which are genuinely helpful.

Two Peeves

I encountered a minor problem using the ASSIGN clause of the SELECT statement. The documentation is unclear when it comes to external file names, and only through experimentation did I discover the proper method for specifying a disk file name: SELECT a file and ASSIGN it to a data name, such as "FILE-ID." Then, in Working-Storage, declare "FILE-ID" and give it a VALUE of a legal DOS file name, such as "B:MY.FIL".

My only major peeve is this package's lack of the COBOL Report Writer feature. I use this feature extensively in my mainframe work, and frankly, I consider manual report generation a giant step backwards. Micro Focus could easily delete the Communications Section of the Data Division (I've never seen it used) and replace it with the Report Section to be used with the Report Writer feature. Doing so would bring this COBOL implementation up to full mainframe potential, which is quite a feat for personal computer software.

Personal COBOL sports a full-screen program editor. Up to 20 lines of text are displayed on the upper portion of the screen. Beneath an end-of-text line is a display of file name, file length, cursor position, and special-key status. The next two lines reveal the function key definitions. The bottom line is used to display messages.

Enter the Editor

You enter the editor by pressing F2 on the main menu. The screen top informs you that the work file is empty. You can start entering a new program immediately, or you can press Alt - F3 to load an existing file from storage. If you can't remember the file name, F2 will display the file directory: move the cursor to the desired file and hit Enter to load the file into the work area.

There are no line numbers with this editor. Proper selection of function keys allows you to insert, delete, undelete, and repeat lines and/or characters, and to split and join lines of text. You can move the cursor using the numeric keypad's cursor control keys or by pressing the F9 or F10 key to shift the cursor one word to the left or right, respectively. The current line is always highlighted. You can scroll up or down using Ctrl-F3 or -F4, and the Home and End keys bring you to the start or end of text. To find (and optionally replace) a character string, you start by pressing Ctrl-F5, but this procedure becomes a bit unwieldy—you must use several additional function keys to specify the various parameters of the find/replace operation.

Although this editor is head-and-shoulders above EDLIN, it is outclassed by the best of the program editors available for the PC (see "Friendly Program Editors," *PC*, Volume 3 Number 6). It has no block commands for moving and copying text. Tabbing is not programmable and is limited to 4-column increments past column 8. You cannot easily make global changes to text; rather, you must find and replace each occurrence of the target text, which is a cumbersome process. Split screen is available, but the same file is shown in both halves. I would have liked to see the capability to look at two different files simultaneously. On the plus side, you can

BUYING A PASSWORD™ MODEM CAN SAVE YOU UP TO $250.

AND THAT AIN'T HAYES!*

You can bank on it. Your outlay will be less than if you settle for our major competitor, but not your output! A Password™ modem sends and receives up to 120 words a minute. Provides both 1200 and 300 baud capacity. Offers total interchangeability that lets you transmit information from any make microcomputer to any other make. And your investment is protected by a 2-year warranty.

Unlike our major competitor, Password™ delivers operating simplicity, plus the convenience of uncommon portability. Thanks to lighter weight, it goes almost anywhere. And because of the ingenuity of Velcro™ strips, it attaches wherever you need it, from the side of a desk to the side of a computer!

This means that Password™ doesn't tie you down, and its price won't hold you up. It features auto-dial, auto-answer, and even knows when to disconnect. If you're cost conscious, but refuse to sacrifice high-speed capability and performance, hook up with the right modem—Password™. The smart decision.

PASSWORD™
by U.S. Robotics, Inc.

™

1123 W. Washington
Chicago, IL 60607
Phone: (312) 733-0497

CIRCLE 498 ON READER SERVICE CARD



*Based on suggested retail price comparisons of U.S. Robotics, Inc. and Hayes Microcomputer Products, Inc.

Sensible Solution™ software from O'Hanlon separates the business tools from the toys!

Finally, a computer language you can understand, and accounting software applications you can really use in your business. The SENSIBLE SOLUTION™ *is not just another "file handler", it is not a toy, it's a brand new computer language. With it, you can modify any of the ready-to-run accounting applications from* O'Hanlon *to better fit the personality of you and your business.*

You see, everyone runs their business just a little bit different. That's why there is a SENSIBLE SOLUTION™ *in the first place.*

My wife Tova, is president of the TOVA 9 *Corporation. Hundreds of people call* TOVA 9 *everyday to order her secret beauty formulas. The* SENSIBLE SOLUTION™ *can help Tova record and track those sales, control her inventory, and handle her payroll.* SENSIBLE *knows exactly who and where Tova's customers are and remembers what they like.*

Even if you've never used a computer before, you can be programming with The SENSIBLE SOLUTION™ *right away. It speaks in English, and you don't have to remember a long list of commands. The* SENSIBLE SOLUTION™ *isn't just user friendly, it's downright sociable!*

Available at computer dealer stores near you!

CIRCLE 467 ON READER SERVICE CARD



O'HANLON
COMPUTER SYSTEMS
11058 Main Street, Suite 225, Bellevue, WA 98004
206/454-2261

Copyrighted material

Drowning in a sea of solutions?



Help's within reach...

Applications backlog. Technology blur. Mounting user pressures. Staying abreast of changing prices. A tidal wave of problems!

Even if some answers *are* available, you have to go to too many sources and sift through so much information, there's not enough time to locate the solutions to your immediate and most important problems.

Well, help IS within easy reach—in the form of an information system that displays all your current software, hardware and communications options for instant reference.

That system is DATA SOURCES, and you're invited to make it work for you. Simply fill in the coupon and we'll send you DATA SOURCES' 4 quarterly editions at 33% off their regular price.

What DATA SOURCES does is organize your options. It guarantees that you've considered all relevant products by guiding you to those with the best possibility of success.

DATA SOURCES is a conveniently sized, extremely well-organized and skillfully indexed 2-volume reference...maintained on a data-base, constantly updated and published quarterly.

YOU GET...

HARDWARE—Over 16,000 products from Micros to Mainframes including peripherals—terminals, printers, memory devices, etc. ...organized by systems compatibility.

SOFTWARE—The largest available inventory of 18,000 business packages for micros, minis, and mainframes including operating systems, utilities, and application packages.



COMMUNICATIONS EQUIPMENT—From modems and multiplexors to local networks, carriers and services, plus all diagnostic and test equipment.

SERVICES, SUPPLIER, SUPPORT—Most complete organized listing of suppliers from installation design to maintenance and data center operations—over 8,000 companies.

NEW FEATURES...

- **Software Index—by package name.**
- **Quick-reference product comparison charts.**
- **Before-you-buy selection criteria and checklist.**
- **Product Hotline—the very latest information on products announced between issues of Data Sources.**

CIRCLE 176 ON READER SERVICE CARD

T282

ORDER NOW AND SAVE $60

Yes! Rush me the latest two-volume edition of DATA SOURCES and enter my subscription at $150 for 4 quarterly editions. I save a full 33% off the regular price of $210.

Name_____

Title_____

Company_____

Address_____

City_____ State_____ Zip_____

Telephone_____

Nature of Company's Business_____

Please check appropriate box: ☐ END USER ☐ VAR/OEM

☐ DISTRIBUTOR ☐ DP MFG ☐ OTHER_____

An information product of Ziff-Davis Publishing Company. Satisfaction guaranteed.

SAVE TIME...CALL DIRECT **1-800-227-1617**
EXT. 251
(In Ca., 1-800-772-3545 Ext. 251)

Return coupon to:

DATA SOURCES

P.O. Box 5845, Cherry Hill, N.J. 08034.

Residents of Ca., Co., Ct., D.C., Fl., Il., Ma., Mi., Mo., N.J., N.Y., Vt., please add applicable state taxes.

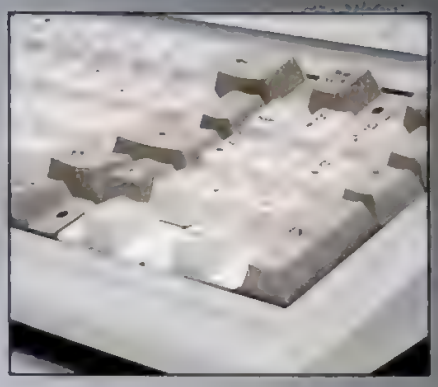
This "Finger Friendly" keyboard will make you more productive everytime you turn on your IBM PC.

Finger Friendly

Do you love your PC, but hate its keyboard? Would you like to have a quiet keyboard, with keys in the standard typewriter position? Now there is a low cost alternative to the IBM keyboard. Look at the improvements:

- ☐ **A Wider, Left Hand Shift Key/in the Standard Typewriter Position.**
- ☐ **Full Width Return Key.**
- ☐ **Lighted Indicators on CAPS LOCK and NUM LOCK Keys.**
- ☐ **A Long ENTER Key Next to Ten Key Pad for Adding Machine-Like Entry.**
- ☐ **Long Life, Capacitive Key Switches with Microprocessor Control.**
- ☐ **No Irritating Clicking Sound.**
- ☐ **Finger Homing Bumps on F, J, and 5 Key of Numeric Pad.**
- ☐ **Two Stage Key Resistance Gives Tactile Feedback Through Your Fingers, not Your Ears.**

And those are just the improvements! You don't have to give up the color matched, low profile case. Or three position height adjustment. It's the enhancement that will make you more productive everytime you turn on your PC.



dealer, no problem. Many dealers now stock Qubie' products, with more adding them each day.

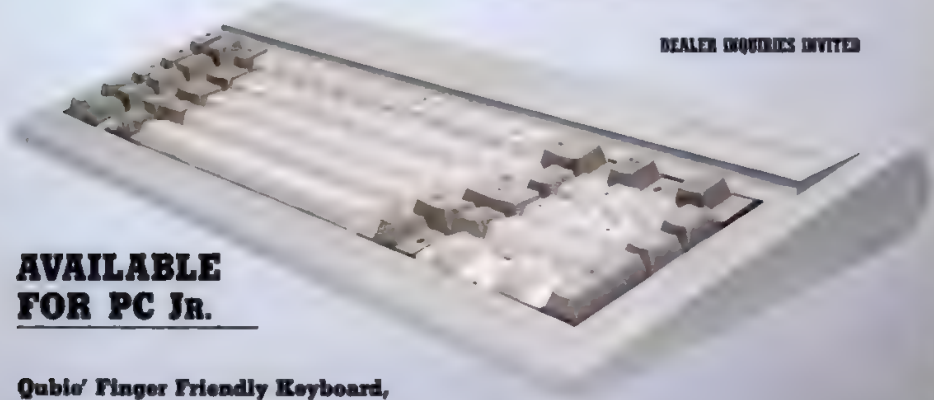
About Us

Although we sell our products direct to you, don't confuse us with mail order companies. You see, we only sell a few selected products, which we stock in depth, and service right here in our own facilities. So you get the mail order sized price, and support based on extensive experience with our products. When you call us you get informed answers.

Whether it's a Qubie' modem, standby power system, multifunction board, or keyboard—we are ready to help you before and after the sale. And if you would rather buy from a local dealer, no problem. Many dealers now stock Qubie' products, with more adding them each day.

All our products come with our 30 day satisfaction guarantee. If you are not completely satisfied you may return the keyboard for a refund, including the postage to send it back. In fact, we suggest you get a competitor to make the same offer, buy both products, and return the one you don't like. We know which one you'll keep.

DEALER INQUIRIES INVITED



AVAILABLE FOR PC JR.

Qubie' Finger Friendly Keyboard,
with 1 year warranty.
Part No. FF5150 **$169.**

IBM is a trademark of International Business Machines Corporation

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $7.50 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, Ca. 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

© Copyright Qubie' 1984

CIRCLE 383 ON READER SERVICE CARD

More COBOL Software

Micro Focus offers a full line of COBOL products that have been specially designed to run on the PC.

The Personal COBOL package reviewed here includes an editor, syntax checker, screen painter (Forms), and COBOL interpreter (the Animator). But Micro Focus offers an array of additional COBOL products that should satisfy every conceivable user.

Two generic COBOL compilers are available as of this writing (April) and a third, specifically tailored to the IBM PC, was scheduled for release in May. The two compilers that are currently available are:

- High-Performance Level II COBOL ($1,995), which compiles COBOL source statements into abstract intermediate code to be processed by the accompanying Run-Time Support (RTS) package. RTS converts the intermediate code into machine language instructions, which are then executed by the CPU. Alternatively, the intermediate code can be recompiled directly into machine language by the 8088 Native Code Generator supplied with the compiler. This recompilation relieves RTS from the task of converting intermediate code into machine language. It also locks you into a particular native code, so if you want to have a transportable executable program, better to leave it in intermediate form.

- Compact Level II COBOL ($1,595) is similar to the high-performance compiler but produces only intermediate code. This compiler's RTS must always convert the intermediate code to machine language at execution time. It has been designed to require less memory and disk space, which can be important if you are programming with limited hardware resources.

Just to make sure they've covered all bases, Micro Focus markets the heart of the Personal COBOL package—Animator ($795) and Forms II ($195) as separate products for use in conjunction with their compilers.

I was able to run some tests on the High-Performance compiler using programs developed with the Personal COBOL package. First, I tried to compile the Forms-generated ISAM-processing program that was described in the main article.

Forget it! Apparently the special characters and syntax associated with the extended ACCEPT/DISPLAY screen capabilities of Personal COBOL were not compatible with this compiler. Thus, you cannot use the Personal COBOL Forms facility in conjunction with the High-Performance compiler. Micro Focus states that the new PC-tailored version of its compiler will be compatible with Forms.

I next wrote a short test program with Personal COBOL that outputs a sequential file of 100 80-byte records. The High-Performance compiler handled this one nicely. I was able to run this test using both the intermediate and native-code outputs of the compiler.

Surprisingly, the execution times for the interpreted, intermediate, and native-code versions of the test program were essentially identical. This is probably due to the predominantly I/O nature of the program; execution time was constrained by the disk drives. A program more evenly balanced between calculations and I/O would probably yield very different results. In this case, the native-code program would be significantly faster than the intermediate and interpreted versions.

With all the purchasing options available from Micro Focus, you may be a little confused as to the best way to spend your hard-earned dollars. Here are some guidelines:

- If you are planning to write programs for your own amusement, or if you are developing programs on the PC for subsequent use on a mainframe, then you need not invest in a compiler at all. Personal COBOL will execute your programs quickly enough for most purposes.

- If, on the other hand, you plan to market COBOL programs to run on the IBM PC, you'll want to invest in the soon-to-be-released Level-II compiler specifically tailored to the PC, as well as the Animator and Forms. Hopefully, the new compiler will be 100 percent compatible with Forms. Since you won't be buying Personal COBOL, you'll need to invest in a separate program editor.

- Finally, for COBOL developers requiring the maximum in hardware/software flexibility, think about getting the Compact Level-II compiler, along with Animator and Forms II and a good program editor. The intermediate code produced by this combination can be packaged with a Micro Focus RTS package (which is available in such interesting flavors as CP/M and UNIX) appropriate to your requirements.—**E.B.**

edit a copy file by placing the cursor on a program's copy statement and pressing Alt-F5. The editor will then load the copy file you have indicated.

When you're finished editing your file, Alt-F4 will save it to storage. The system displays a warning message if you're about to overwrite an existing file and asks for your permission before continuing.

I was curious whether *SPF-PC*, my favorite full-screen editor, could create COBOL code fully compatible with the Personal COBOL editor. A short test program proved this to be no problem. The editor is good enough to do the basic tasks of creating and changing COBOL source programs. However, it lacks the conveniences professional programmers have come to expect from an editor. It is the weak link in the Personal COBOL integrated chain.

The Syntax Checker

After editing your COBOL masterpiece, press F3 on the main menu to initiate the syntax checker. You cannot avoid this step: Personal COBOL simply will not execute an unchecked program. The main check menu lets you direct the source code display to the printer. You also can specify whether the checker should pause following each error (Pause mode).

Enter or select the file name to be checked and press Return to start the process. Each line is displayed or printed as it is checked. In Pause mode, the syntax checker will generate a diagnostic message when it detects an error and ask your permission to continue. If you decline, the checker graciously yields the floor to the editor, which automatically positions the cursor at the offending bit of code. After applying corrections, you can start the checking process all over again. Upon completion, the checker will display the error count and program size.

The syntax checker proved reliable, fast, and easy to use with no bad habits.

The Personal COBOL Animator is a full-fledged execution and debugging environment. Pressing F4 on the main menu invokes the Animator. Although the system assumes you want to execute the program just checked, you can enter/select a different program, as long as the latter has been checked. If you simply wish to run the program without debugging, pressing the F3 key puts you into Zoom mode. Hit the Enter key, and your program executes normally.

The Personal COBOL Animator is a full-fledged execution and debugging environment.

The fun part of the Animator becomes apparent when you decline to use the Zoom option. In this case, the program's Procedure Division is displayed on the screen. Each line of code is highlighted as it executes. Function keys are used for screen and cursor control. Besides the normal function key list at the bottom of the screen, the Animator displays a list of one-letter commands you can use to customize the debugging session. You can (S)tep through each statement sequentially, you can set a relative execution speed and make the program (G)o, or if you've had enough debugging, you can (Z)oom to completion.

Further execution control is available by jumping to the NEXT-(I)F statement in the program, and by (R)esetting the cursor at any time to a different statement. Additionally, you can set a (T)hreshold-level of nested performs and calls, below which only zooming occurs.

Control breaks can be established in various ways. You can specify (B)reakpoints at any location in the program. The (E)nvironment can be set to cause a break whenever selected programs are called, and you can state a condition using COBOL syntax which will not cause a control break (U)ntil the condition is true.

Once a break occurs, you may wish to (Q)uery the contents of a data item or perhaps immediately enter and (D)o a COBOL statement. If your program uses screen displays, you can toggle F2 to alternately view the executing code and the program-generated screens. Other interesting options are to (F)ind the next occurrence of a character string or to (L)ocate the next reference to a given data name, file name, or paragraph label.

I had only a few minor quibbles with the Animator. You are limited to a single global condition break, (U)ntil, and to a single data item to constantly (M)onitor. Also, the split screen capabilities of the Animator appear to have little value. But, as you can see, the scope and control of the Animator is tremendous. If you haven't experienced the pleasures of real-time debugging you may find the large array of features bewildering. My advice is to hang in there—once you've mastered the Animator, dump-busting and READY TRACE will seem as archaic and primitive to you as stone knives.

Forms

Personal COBOL comes with an unexpected yet welcome bonus—screen painting. To enter Forms mode, select F2 while in the editor. You can now draw a new screen or load one from storage.

Pressing F2 on the Forms menu toggles you between text and data drawing. Text drawing is used to create display literals. You can manipulate the appearance of any text string by setting its one-character attribute byte using the function keys. Indulge your artistic sensibilities by changing the color (foreground and background) or intensity of a text string. You can even make it blink. You may use any character in the IBM PC set by selecting from a list at the bottom of the screen. F3 or F4 moves the selection to the left or right, and F5 paints the chosen character on the screen. Pressing the Ctrl key in combina-

tion with the cursor control keys supplies you with preformed corners and vertical lines for box drawing.

Once you're happy with the text screen's look, toggle to the data screen to define variables. Simply draw the picture of any data item by using the standard COBOL editing characters: X for alphanumeric, 9 for numeric, Z for zero suppression, and so on. The available editing characters are thoughtfully displayed at the bottom of the screen. The previously drawn text is visible on the data screen, making it easy to align variables with literals. When you finish painting, save the form with Alt-F4.

> Once you've mastered the Animator, dump-busting and READY TRACE will seem as archaic as stone knives.

So far, you've drawn and saved a display screen (Figure 1). The next step is to create the COBOL code to define and use the screen. Personal COBOL assists you by providing a program, SKELETON (Figure 2) on the example disk. This program predefines several data items that the screens require. You must load SKELETON into your work file and place the cursor on the indicated comment line in the Working-Storage Section. Next, press Alt-F5 for the Generate COBOL menu, then F2 to have Personal COBOL create a Data Division copy element defining the screen (Figure 3). The appropriate COPY statement will appear in your work file at the point where you placed the cursor.

Return to the Generate COBOL menu, and use the F3 key to generate in-line Procedure Division code (Figure 4). This code will DISPLAY the screen and ACCEPT the first variable data item. At this point you should save the work file (rename it first so as not to destroy the SKELETON program).

The entire process is easier to do than to explain. The generated code performed correctly with several test screens and saved hours of work. While COBOL is not my language of choice for screen processing, I commend Micro Focus for including the time-saving Forms facility in this package.

One additional Forms feature deserves mention. Instead of generating fragments of source code, you can instruct Forms to create an entire Indexed Sequential Access Method (ISAM) file maintenance program. This can interactively add, change,

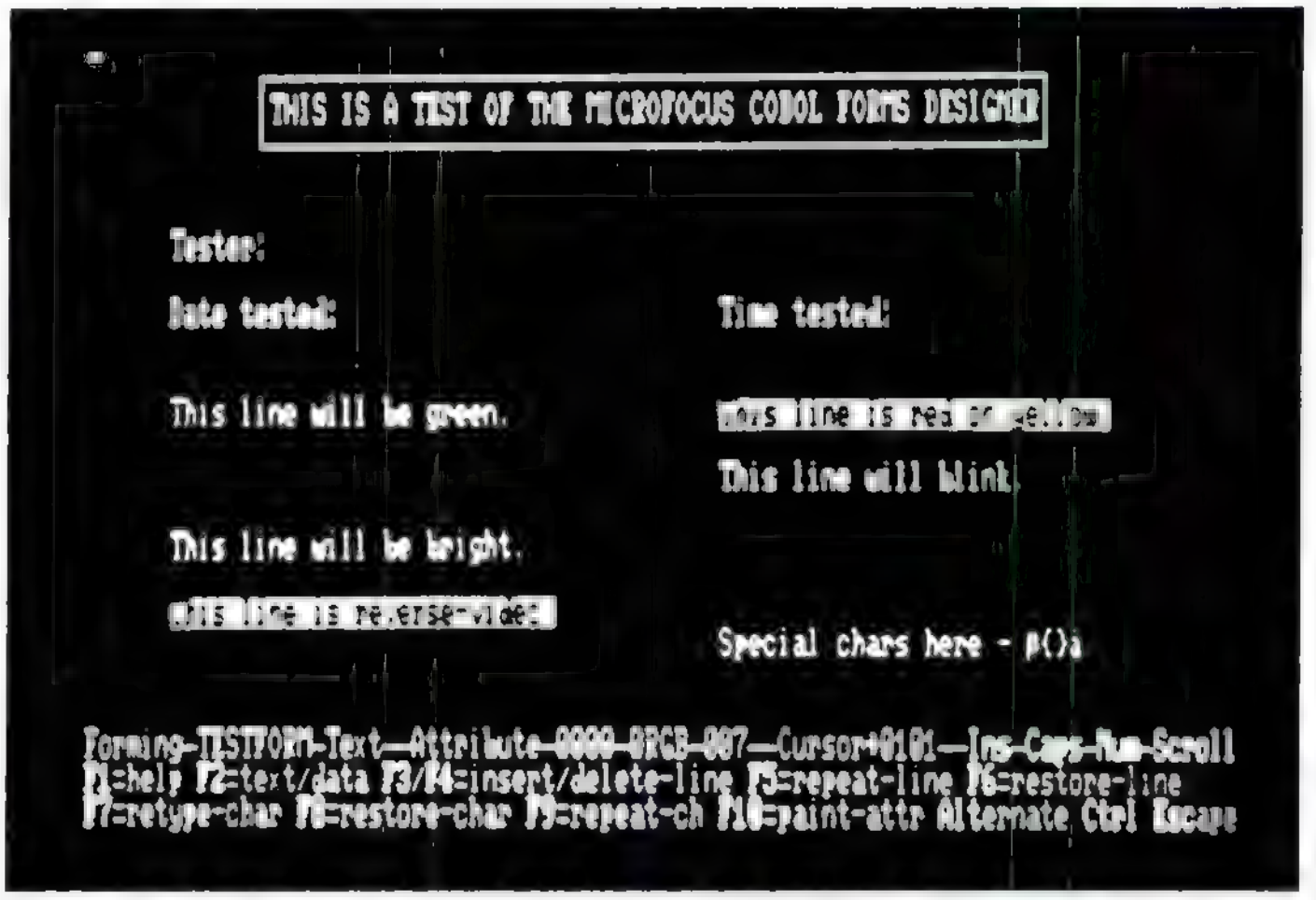


Figure 1: *A display screen created with the* Personal COBOL *forms designer.*

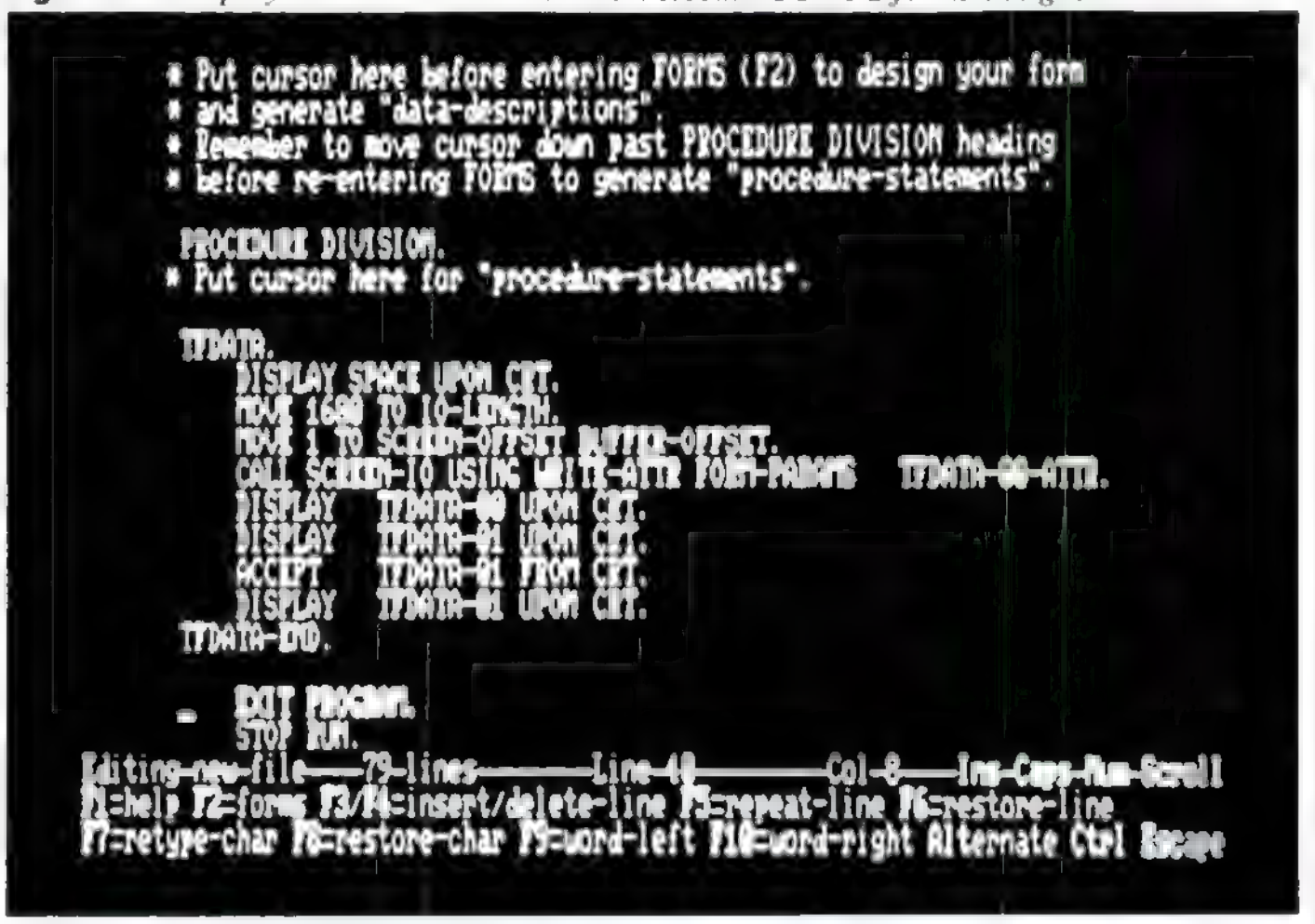


Figure 2: *The SKELETON program, which lists required fields for designing forms.*

Professional tools for the software developer and business system user.

ProTools™
MORNING STAR SYSTEMS, INC.

ProLibrary
Professional C Compiler Tools

These tools go beyond access to ROM Video and DOS 2.0 functions. Tools to write 8088 interrupt handlers and DOS 2.0+ device drivers. Flexible segment: offset addressing functions. DOS 2.0+ path handlers, set environment, run-time batch commands, and execution executive. DOS 3.0 upgrade. Lattice 2.0 compatible.

ProBatch
Professional Batch Tools

Sophisticated batch commands to control job execution. chmod to change or display file attributes. when to control job execution by time, day or date. ifset/-switch/case to control job execution sequence. pr for flexible file printing. mount to access floppy disks by volume id. Many other powerful batch commands. All commands may be piped. All commands use 2.0 path. All commands controlled by set environment.

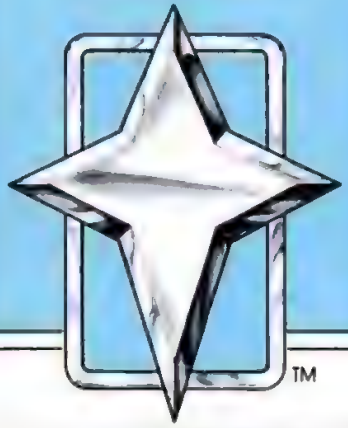
ProScreen
Professional Screen Manager

Editor for creation and management of screens. Screen storage in file or in program. Data entry screens, menus, windows and on demand help. Forms and box generation. On screen buttons and graphic/mono icons. Mouse and light pens supported. Run-time access by LINK library or by interrupt function.

ProLibrary (includes Source) $200.00
ProBatch $200.00
ProScreen $300.00
ProScreen (with C Source) $450.00
MicroSoft C Compiler $400.00
Lattice C Compiler $400.00
Shipping & Handling Additional/ VA Residents 4% Sales Tax/ MC/VISA COD/ Check-OK

(703) 425-6422
Dealer Inquiries Welcomed

MORNING STAR SYSTEMS, INC.
9202 Alyssum Way
Annandale, VA 22003



CIRCLE 127 ON READER SERVICE CARD

delete, and retrieve records on an ISAM file composed of the variable data items from your screen. Paint the screen as usual, then press Alt-F10 to mark the data items that are to be the index key fields for the file. Hit F4 on the Generate COBOL menu, and voilà! A working program appears. The generated program had flaws: meaningless data-item names, unindexed paragraph labels, and GO TO's. Still, this is one of the quickest ways I've seen to create a simple application. ■

Eric Bank is a data processing consultant specializing in COBOL-based commercial applications.

```
      ****** Skeleton Program for use with PERSONAL COBOL FORMS. ******

       WORKING-STORAGE SECTION.
      * The following fields will be required if you use FORMS (F2)
      * to generate procedure code for screens using attributes.
       01  SCREEN-IO           PIC X              VALUE X"07".
       01  WRITE-ATTR          PIC 99     COMP    VALUE 3.
       01  FORMS-PARMS.
           03 IO-LENGTH        PIC 9(4)   COMP    VALUE 1680.
           03 SCREEN-OFFSET    PIC 9(4)   COMP    VALUE 1.
           03 BUFFER-OFFSET    PIC 9(4)   COMP    VALUE 1.

      * Put cursor here before entering FORMS (F2) to design your form
      * and generate "data-descriptions".
      * Remember to move cursor down past PROCEDURE DIVISION heading
      * before re-entering FORMS to generate "procedure-statements".

       PROCEDURE DIVISION.

      * Put cursor here for "procedure-statements".

Editing-new-file----61-lines----------Line-1----------Col-8----Ins-Caps-Num-Scroll
F1=help F2=forms F3/F4=insert/delete-line F5=repeat-line F6=restore-line
F7=retype-char F8=restore-char F9=word-left F10=word-right Alternate Ctrl Escape
```

Figure 3: *A Data Division copy element that defines the screen painted by Forms.*

```
           03 FILLER             PIC X(0179).
           03   TFDATA-00-0707 PIC X(0007) VALUE "Tester:".
           03 FILLER             PIC X(0153).
           03   TFDATA-00-0907 PIC X(0012) VALUE "Date tested:".
           03 FILLER             PIC X(0026).
           03   TFDATA-00-0945 PIC X(0012) VALUE "Time tested:".
           03 FILLER             PIC X(0150).
           03   TFDATA-00-1207 PIC X(0024) VALUE "This line will be gree
          "n.".
           03 FILLER             PIC X(0173).
           03   TFDATA-00-1444 PIC X(0022) VALUE "tThis line will blink.
          "".
           03 FILLER             PIC X(0101).
           03   TFDATA-00-1607 PIC X(0025) VALUE "This line will be brig
          "ht.".
           03 FILLER             PIC X(0135).
           03   TFDATA-00-1807 PIC X(0027) VALUE "This line is reverse-v
          "ideo.".
           03 FILLER             PIC X(0091).
           03   TFDATA-00-1945 PIC X(0025) VALUE "Special chars here - @
Editing-TFDATA-----19-lines----------Line-21----------Col-8----Ins-Caps-Num-Scroll
F1=help F2=forms F3/F4=insert/delete-line F5=repeat-line F6=restore-line
F7=retype-char F8=restore-char F9=word-left F10=word-right Alternate Ctrl Escape
```

Figure 4: *Procedure Division code that displays the screen defined in Figure 3.*

A Brush with Fun

ROLLO is a creative painting game that comes through with flying colors, but B-1 Nuclear Bomber and Computer Football Strategy are not even in the picture.

Every time I try to imagine the R&D session at Windmill Software's corporate offices where this game was created, I come up with the picture of a wild party featuring the Marx Brothers, Monty Python, and a large number of tequila sunrises.

In a word, *ROLLO* (or to use its full title, *ROLLO AND THE BRUSH BROTHERS*) is bizarre. It's also a whole lot of fun, as long as you're not called upon to prepare a synopsis of the story line for your "Classics of Western Literature" symposium.

Here's the plot, as outlined by Windmill Software: "As ROLLO, the brilliant star of our scenario, your aim is to paint squares around the bristly BRUSH Bros., Harry, Perry, and Swipe. Their old-fashioned brushes prove strong competition, but you're the bright, new breed—rollering wall after wall of glorious, streaming color. Take care to plan your strokes, for while you're hard at the job, the bothersome Brothers' aim is to see you all washed up.

"You've got to out-stroke, out-color, and out-roll the whole bristly crew. They'll bully you into a corner and make off with your paint, but you'll be ready with a quick toss of a bomb.

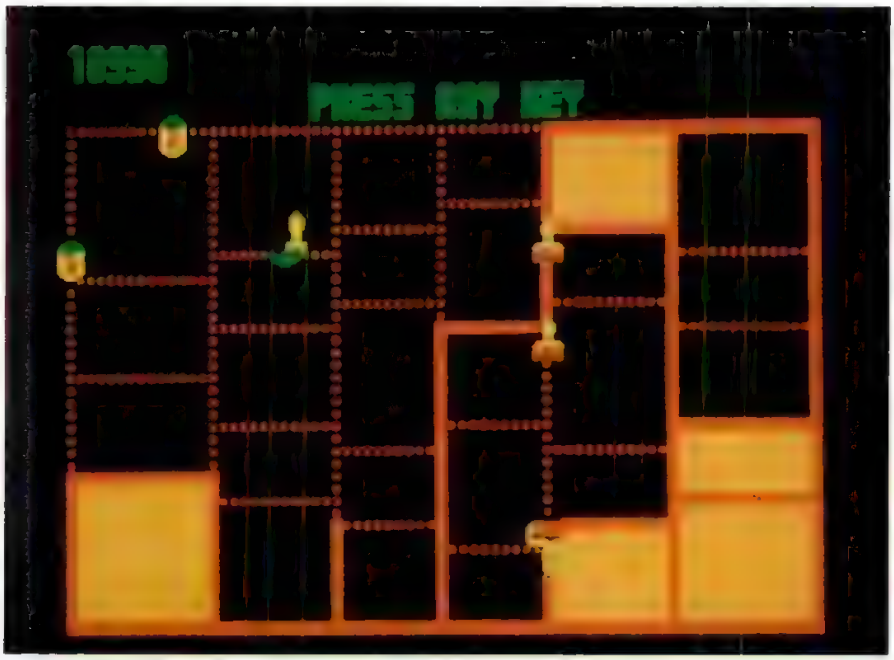
"You slap on the first coat, then the second, and faster than the flap of a bristle, the third coat's dry and you're on your way to a higher level. The color chart at the top of the screen points the way to finish the job.

"Just as you've mastered your strategy, the BRUSH Bros. add to the rules! In the second level, one coat of paint does the whole job, but now your roller keeps running out, forcing you to dash back to the nearest bucket. This level ends when all your buckets run out."

Whew! Sounds about as exciting as

ROLLO
Windmill Software, Inc.
P.O. Box 1008
Burlington, Ontario L7P 3S9 Canada
(416) 336-3353
List price: $39.95
Requires: 64K RAM, color/graphics adapter, color monitor recommended, joystick and game adapter optional.

CIRCLE 795 ON READER SERVICE CARD



A second-level *ROLLO* screen showing paint buckets.



CIRCLE 295 ON READER SERVICE CARD

▶ Pascal and C Programmers

▶ Blaise Computing's productivity tools allow Pascal and C programmers to develop reliable software taking full advantage of the capabilities of the IBM PC and XT. Support for Microsoft and IBM Pascal, Microsoft (Lattice) C and CI-C86 is provided.

▼

TOOLS All Source Code is included

Total string capability, complete screen access, keyboard handling, a graphics interface, access to all BIOS functions, and much more are provided in over 40 routines.

▼

TOOLS 2 All Source Code is included

A general DOS gate allows you to access any DOS 2.0 function from Pascal or C. Program execution and DOS internal command execution are supported as high level calls.

▼

VIEW MANAGER Source Code available

VIEW MANAGER is a screen support system of a mainframe for the IBM PC/XT. Screens are constructed with a true Screen Painter supporting any attribute or color, and the screens are stored efficiently in a Screen Database. VIEW/LIBRARY supports access to screens and true block mode data capture and display from application programs.

TOOLS	125.00
TOOLS 2	100.00
VIEW MANAGER	275.00
VIEW MANAGER (with Library Source)	425.00
MS-Pascal Compiler	275.00
Microsoft C Compiler	450.00

BLAISE COMPUTING INC.

2034 Blake St. Berkeley, CA 94704 415/540-5441

CIRCLE 150 ON READER SERVICE CARD

PC ARCADE

watching paint dry, doesn't it? But, like a tube of oil paint, this little number sticks with you. The play action is quite good when you use the keyboard's cursor pad (the joystick version is more sluggish), and the graphics and sound are lively. Your roller is pursued by two types of tormentors: slow-moving counter-brushes and a speedy bristle brush that sweeps around the screen like Walt Disney's broom in *The Sorcerer's Apprentice*. You are also granted five spray bombs that you can use to temporarily remove your attackers from the screen. The art of bombing, though, is an acquired skill—the timing must be just right.

Like any successful arcade effort, *ROLLO* is difficult but learnable. Though there are three levels, the entry speed contains sufficient challenge to keep the new player coming back for more. And, as you get better at painting those squares and dodging those brushes, the game becomes more and more challenging.

ROLLO constitutes Windmill Software's fourth solid product for the PC. The company has already brought forth *Styx*, *Digger*, and *Conquest*: clones of the arcade favorites, *Qyx*, *Dig-Dug*, and *Joust*, respectively. This one, though, is a more-or-less original effort, although it borrows its "turn the tables" offense from *Pac-Man*, its frenetic chase from *Digger*, and its coloring-book goal from *Styx*.

Once again, we award a high score after tilting at Windmill's latest. On *PC*'s scoring range from one to six, *ROLLO* paints a pretty picture:

FUN:	4.5
CHALLENGE:	4.5
COLOR/GRAPHICS:	5
TOTAL:	14

B-1 Nuclear Bomber
Microcomputer Games, Inc.
The Avalon Hill Game Company
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-5300
List price: $21
Requires: 48K RAM, BASICA, color/graphics adapter.

CIRCLE 796 ON READER SERVICE CARD

Yes, folks, from Avalon Hill, the people who brought us VC, the Vietnam War



The view from the cockpit of *B-1 Nuclear Bomber*.

MICROXPRESS

EXPANSION BOARDS

AST RESEARCH
All options available. Expansion memory.
Mega Plus II (64K) ..... From $280
I/O Plus II ..... From $130

QUADRAM
Memory Expansion Options
Quadboard ..... From $240
Expanded Quadboard ..... From $240
Quadboard II ..... From $240
Combo Plus II ..... From $240

LOCAL AREA NETWORKING

PC NET (STARTER KIT)
Includes 2 PC Net Network Adapter Cards, 2 BNC Connectors, 1 PC-C050 Coax Cable, 2 BNC 75 Ohm Terminators, 1 PC Net User PC Software, 1 PC Net Shared PC Software, User's Manual ... $1300

PRINTERS

OYNAX DAISYWHEEL
OX-15 Centronics Parallel
OX-15 R32C Serial .....
Tractor

BROTHER DAISYWHEEL
HR-1A Centronics Parallel
Tractor

OKIDATA DOT MATRIX
93 (120 CPS)

SUBSYSTEMS

I2BM-10P — Interface
10MB Subsystem $1395

I2BM-15P — Interface
15MB Subsystem $1695

WS1 — Maynard
Sandstar Multifunction Card $1070

WS2 — Maynard
Winchester Subsystem With Sandstar Floppy Drive Controller Card $1140

WS3 — Maynard
Winchester Subsystem With Sandstar Memory Card $1140

Introducing Tandon

Disk storage for your PC.
5¼" WINCHESTER SUBSYSTEMS



TM 502, 5MB FORMATTED CAPACITY List $1995 NOW $1495

SOFTWARE UTILITIES

TALL TREE
J Format-2, Windrive, Jetdrive, J-Spool ..... Each $40

DISK CONTROLLERS

MAYNARD ELECTRONICS
FDC 5¼" - Floppy Drive Controller ..... From $165
FDC 8" - Floppy Controller . From $175
Hard Disk Module $360

MAYNARD SANDSTAR SERIES ..... Call

MODEMS

HAYES
Smart Modem 300 ..... $230
Smart Modem 1200 ..... $610
Smart Modem 1200B $445
Smartcom II Software $80
Cable $19

COLOR/GRAPHICS CARDS

HERCULES Graphics Card $380
QUADRAM Quadcolor ..... Call
Quadcolor II ..... Call
PLANTRONICS Colorplus with **DRAFTSMAN** Software ..... Call
PARADISE SYSTEMS
Multi Display Card $365

MONITORS

AMDEK
VIDEO 300
VIDEO 500
Monitor
COLOR I
Composite Color
COLOR II
HX-12

DISK DRIVES

5¼" FULL HEIGHT — Internal Mounting Flexible Disk Drives

TANDON
TM 101-

5¼" HALF HEIGHT — Internal

CONTROL DATA
CDC 9428 $199

TANDON
$200
$245

TEAC
$189
$212

QUMETRAK
142A $205

3" THINLINE
TANDON
$325

5¼" THINLINE FLOPPY DISK SUBSYSTEM

1-8480 Dual Drive, Double-Sided 2.4 MB $1495

1-8481 Single Drive, Double-Sided 1.2 MB; Incl. Filler Panel - Second Drive Can Be Added Later $995

Special Xpress

64K RAM CHIPS (Set of 9) 150 NS	$ 52
64K RAM CHIPS (Set of 9) 200 NS	$49
TANDON 5¼" Disk Drive TM 100-2	$199
CONTROL DATA 5¼" Disk Drive CDC 9409	$220

TERMS: Visa, MasterCard, Personal and COD accepted. Add 2% shipping & handling on all orders. Combination and quantity discounts are applicable. No refunds. Under certain situations credits for future purchases may be applied.

WARRANTY is 90 day repair/replace to 1 year depending on manufacturer on all hardware products.

Prices subject to change without notice. 20% restocking charge for all returned items.

FOR XPRESS SERVICE, PHONE
Toll Free 1-800-632-8515
California 1-714-632-8512
Hours: 8 AM - 6 PM Mon.-Fri.
10 AM - 4 PM Sat.
For Customer Service Call 1-714-632-8996

Microxpress features a full line of peripheral products for the IBM PC. Call today for pricing on monitors, printers, modems, disk drives, expansion boards and graphics cards.

SERVICE: Phone Number (714) 632-8996 for in and out of warranty returns which require an MRA (Material Return Authorization) Number.

MICROXPRESS
305 S. State College Blvd., Suite 135
Anaheim, CA 92806

CIRCLE 341 ON READER SERVICE CARD

How to teach your kids about the IBM PC.

Now you can teach your children how to use your PC without bogging them down in the user manual...without spending hours demonstrating the simplest functions...and without fear that they'll break your PC because they don't know how to use it properly.

You can do it with the PC edition of *Computers for Kids*—a BASIC learning text whose Sinclair, Apple, and Atari editions have already introduced thousands of children and parents to computers.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

Take it from Donald T. Piele, Professor of Mathematics at the University of Wisconsin (Parkside): *"Computers for Kids* is the best book available for introducing children to the IBM PC. And it's a perfect tool for adults who are learning about computers and programming *with* their children."

So do your children a favor. Do yourself a favor. Order the PC edition of *Computers for Kids* today!



Here are just a few of the useful and exciting topics covered in *Computers for Kids:*

- **What is a computer?**
- **Flowcharting**
- **Running the IBM PC**
- **Getting Ready to Program**
- **PRINT and Variables**
- **GOTO, INPUT and RND**
- **IF-THEN and FOR-NEXT**
- **Graphics Programs**
- **Sample Programs**
- **Glossary of Statements and Commands**
- **Notes for Teachers and Parents**

Creative Computing Press
Dept. NF3B 39 East Hanover Avenue, Morris Plains, NJ 07950

Send me _____ *Computers for Kids*, PC edition, at $5.95 plus $1.50 postage and handling each. #12K
Also available at your local bookstore or computer store.

☐ **PAYMENT ENCLOSED $**_____ *Residents of CA, NJ and NY State add applicable sales tax. Outside USA add $3.00 per order.*

☐ **CHARGE MY:** (Charge and phone order $10 minimum)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Mr./Mrs./Ms._____
(please print full name)

Address_____ Apt._____

City/State/Zip_____

☐ Send me a FREE *Creative Computing* Catalog.

computer board game, comes another exercise in exaltation of man's greatest effort: *B-1 Nuclear Bomber*. Although completely without redeeming social value, if *B-1 Nuclear Bomber* weren't so frightening, it *might* have been funny.

Read this and weep: "7 July 1991. You are the commander of a B-1 supersonic bomber flying a routine deterrence mission over Thule Air Force Base, Greenland. The radio man reports receiving a top-priority coded message from the Airborne Command Post: 'War Plan Alpha-5. This is not a drill.'

"You swallow hard, trying not to think of your wife and children, sleeping at this moment in their comfortable suburban Maryland home near Washington, D.C. There are no safe areas in nuclear war.

"You get a course to Moscow from the navigator, turn the nose of your B-1 toward the U.S.S.R., and prepare to carry out your mission. Perhaps, if your family is lucky, they will die quickly in their sleep. Meanwhile, your job is to make sure that aggression is punished. The politicians will have to try to pick up the pieces later, if any. . . ."

I shall attempt to keep my personal political and moral outrage to a minimum and concentrate instead on the worthiness of this product as a game. In a word: pitiful. The graphics are minimal, the sound effects are limited to annoying beeps, and the amount of thinking and reflexes demanded of the player is minuscule. Not that it gives me much comfort, but the designers have also assumed a tremendous amount of American military superiority: All it takes to get a MIG-25 off your tail is to type in "EC" for Electronic Countermeasures. My only problem was that I missed the display of the secret 5-letter fail-safe code at the start of my mission, and, after I had (yawn) navigated my B-1 bomber to target Yerevan near the Turkish border, I was unable to successfully Drop the Big One.

I hadn't the slightest interest in trying again.

Like all of the Avalon Hill games

"Infoscope Can Renew Your Faith In Your Computer"



"For years, people said I was forgetful.

"Now I have a memory. It's Infoscope. Infoscope makes it simple for me to load our personal computer with everything I want to remember about my congregation. Birthdays. Weddings. Maiden names. Addresses. Children's names and ages. And I can pull out that information any way I want it, almost instantly.*



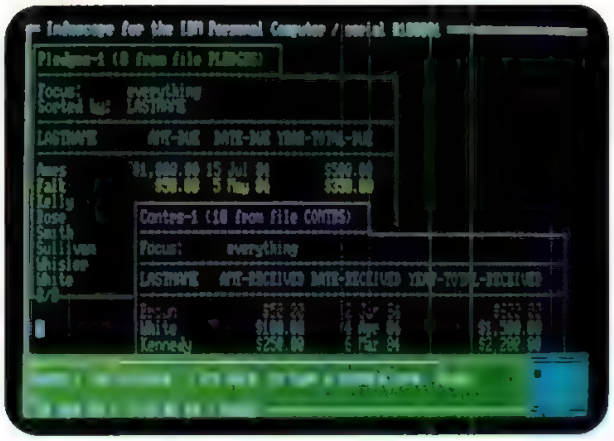
"Anniversaries in January? I can display them all in a split second. (The Calhouns were very impressed that I remembered.)

"Infoscope works with me, not against me. If I misspell a word, Infoscope suggests the right way. Politely.

"Bless you, Infoscope.

"When I don't know what to do next, I turn to Infoscope's help system. It tells me what I can do, and how to do it. If I don't understand a prompt, it'll explain it.

"(Once in a while, it's nice to get advice for a change.)



"Then there are the windows. I can create a dozen of them, any size, any part of the screen ... and display a different set of information in each one. It makes it easy to compare things — like building fund pledges compared with contributions.

"Before Infoscope, I thought our personal computer was just fun and games. Now it's a hard-working member of the family. Infoscope sure made a believer out of me."



Infoscope is a trademark of Userview Corp

*Infoscope operates on data in RAM, so it's 4 to 100 times faster than other information management programs. For a demonstration, see your retailer. Or, write for details:

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

CIRCLE 326 ON READER SERVICE CARD

reviewed in this column, this one appears to be an assembly line make-over of a TRS-80, Atari, Commodore, Apple, or Timex/Sinclair product. This product makes no effort to take advantage of the IBM PC's special features, and no effort was made to update the title and theme of this 1980-vintage game: the B-1 bomber project was a Pentagon pipe dream that has faced numerous delays and challenges from Congress.

Unfortunately, Avalon Hill's *B-1 Nuclear Bomber* game is already in production and can't be proscribed by Presidential fiat or Congressional resolution. On *PC*'s rating scale from a low of one to a high of six, this product is a nuclear fizzle:

FUN:	2
CHALLENGE:	1
COLOR/GRAPHICS:	1.5
TOTAL:	4.5

Computer Football Strategy
Microcomputer Games, Inc.
The Avalon Hill Game Company
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-5300
List price: $21
Requires: 64K RAM, BASICA.

CIRCLE 797 ON READER SERVICE CARD

Moving on to football, Avalon Hill presents another bomb. Though the designers make a pretense of offering a true computer simulation of football, the "game" is merely a boring substitution of the computer's random number generator for a set of dice. Once again, Avalon Hill shows no feel for the PC.

Computer Football Strategy possesses *no* sound effects, and the screen image is white on black, using only standard ASCII characters.

I imagine some of the regular readers of this column must be getting as tired of reading about Avalon Hill's limp offerings as I am of reviewing them. I keep hoping that this 25-year-old company with its fine reputation for board games will one day realize that while computers are a different, capable medium for games, they demand special attention.

Computer Football Strategy is minor league:

FUN:	2.5
CHALLENGE:	2
COLOR/GRAPHICS:	0
TOTAL:	4.5

■

A NEW KIND OF COMPUTER STORE

★ WE DISCOUNT EVERYTHING ★

Hayes
300 BAUD 219.95
1200 BAUD 479.95
★ 1200 B INTERNAL 399.95
★ INCL. FREE SOURCE SUBSCRIPTION/ SMART COM II ★

MicroPro
WORDSTAR 269.95
WORDSTAR PROFESSIONAL 359.95

AMDEK 310A 159.95
TAXAN 420 RGB W/CABLE...CALL

SIDEWAYS 45.95

MICROSOFT
MULTIPLAN 129.95
WORD WITH MOUSE 299.95

COPY II PC 29.95

KOALA PAD 99.95
PFS: FILE, WRITE, REPORT, GRAPH ..... EA. 89.95

dBASE II 349.95

Lotus 1-2-3 ... 299.95

OKIDATA ★ INCL. FREE PLUG & PLAY W/IBM CABLE PURCHASE ....29.95 ★
★ OKI 92P 439.95
★ 93P 599.95

MICROCOM Era 2 ..... 339.95
INCL. FREE SOURCE TIME & TERMINAL SOFTWARE

AST RESEARCH INC.
AST 6 PAK + 64K 269.95
AST MEGA + II 64K 269.95

MANAGING YOUR $..... 129.95
KNOWLEDGEMAN 349.95
DOLLARS & SENSE 99.95
EPSON FX 80 F/T 449.95
EPSON FX 100 F/T 659.95

NEC ★ 2050 ..... 799.95
★ 3550 ..... 1595.95
★ INCL. RIBBON & THIMBLE ★

Verbatim
SSDD 23.95
DSDD 34.95

★ ★ CALL FOR OTHER PRICES ★ ★
BECAUSE HARDWARE AND SOFTWARE PRICES ARE CHANGING SO RAPIDLY, WE URGE YOU TO CALL US FOR OUR VERY LOWEST CURRENT PRICES!
WE APPRECIATE YOUR BUSINESS and will do everything we can to make you happy
TERMS: F.O.B. Westminster CA. We accept VISA MasterCard. Cash, Checks, Certified Checks are better. Money Orders and Purchase Orders (2% 10-Net 15). Add 2% for bank cards & P.O.'s. Ask about our return policy. Prices are subject to change and hopefully will go down!
Subject to stock on hand 7/84

GARDEN OF EDEN
COMPUTERS
ORDERS ONLY
800-762-3227
OUTSIDE CALIFORNIA ONLY
714-841-4994
INSIDE CALIFORNIA
16485 Magnolia, Westminster, CA 92683
½ blk. N. of the 405 Frwy.
Mon-Fri. 10-6:30 Sat 10-5
CLOSED SUNDAYS & TUESDAYS

CIRCLE 319 ON READER SERVICE CARD

The Reference Shelf: Where to Turn

When you need to know what to buy, what to read, where to go, or whom to ask, here are some computer reference books you can count on to point you in the right direction.

Apart from the technical manuals that hackers dote on, the computer reference bookshelf breaks naturally into several distinct categories: Which computer/program/book should I buy, where can I find out what I need to know, and what in heck does that mean? Here are a few specimens.

The Reader's Guide to Microcomputer Books
Michael Nicita and Ronald Petrusha
Brooklyn, New York: Golden-Lee Book Co.
420 pages, paperback, $9.95
ISBN: 0-912331-00-3

A book may be the cheapest insurance you can buy to help you obtain the full value from your investment in a microcomputer—but only if it's the right book. *The Reader's Guide* goes a long way toward eliminating the guesswork involved in purchasing "bookware." Of course, there's no substitute for actually thumbing through a book to see whether it covers all you want to know. But the 351 evaluations of 406 titles presented here can direct you to the better efforts first and give you sufficient context to compare several books covering the same topic.

While only one-fifth of the books published last year are included, they represent the full spectrum of computer titles, from general introductions to language-, program-, operating system-, and computer-specific tutorials, and from beginning texts to advanced references. The reviews are mostly 250 to 350 words long and stick



strictly to the matter at hand, ticking off each book's contents and merits with cogency and economy. In addition to the description and publishing information, the authors assess each book's level of difficulty.

The evaluation itself is quantified into a rating from 10 to 100. For books I was already familiar with, I found the ratings reliable and consistent if somewhat skewed towards the high end. But this grade inflation may appear worse than it is, since few real lemons are included among the books reviewed.

Book and computer store managers in particular will appreciate the care and labor that went into this guide's preparation and will be able to follow its precepts when stocking their shelves.

Excerpt: *We all know that peculiar species of world traveler whose ability to communicate in a foreign language is limited only by his ability to shout in English. Unfortunately, we do not all know his computer-book equivalent: the author whose ability to clearly relate complex ideas is limited only by his ability to truncate sentences and strip language of all words remotely polysyllabic. Sentences stay short. Words stay simple. See John's computer run.*

"Computers are like small children," write [the authors]. And only a businessperson with a lemonade-stand mentality would seriously consider buying this book, we add.

The Addison-Wesley Book of IBM Software, 1984
Edited by Robert P. Wells, Sandra Rochowansky, and Michael F. Mellin.
Los Angeles: The Book Company.
442 pages, paperback, $19.95
Supplementary updates, $10 yearly.
ISBN: 0-201-16455-8

PGS introduces the no-compromise monitor to meet your no-compromise needs.

High resolution

Once you've invested in a first-rate computer, you don't want to compromise with a second-rate monitor. That's why PGS introduced the first no-compromise monitor, the Princeton HX-12. It set the price/performance standard for high resolution RGB color monitors.

Super resolution

Now we're introducing the first no-compromise monitor in the super resolution class. It's our new SR-12: an RGB monitor that meets the most demanding expectations at a price that will surprise you.

Monochrome

And, for price/performance in a monochrome monitor, we're introducing the MAX-12: our new amber monitor that's as easy on the eyes as it is on your budget.

The monitor to meet your needs

All three PGS monitors are engineered for no-compromise performance to provide you with a cleaner, sharper image than any other monitor in the same price class. The HX-12 and the SR-12 both feature uncompromising color convergence for crisp whites without color bleed. The MAX-12 offers impressive clarity in a monochrome monitor with easy-on-the-eyes amber phosphor.

And all three monitors come with a non-glare screen and a shielded cable that plugs directly into the IBM PC or XT.

The HX-12 has the highest resolution (690x240) and the finest dot pitch (.31mm) in its class. And yet its suggested retail price is comparable to many medium resolution monitors. The HX-12 brings no-compromise color to the PC and now, with the PGS RGB-80 board, to the Apple IIe as well. **Suggested retail price: $695.**

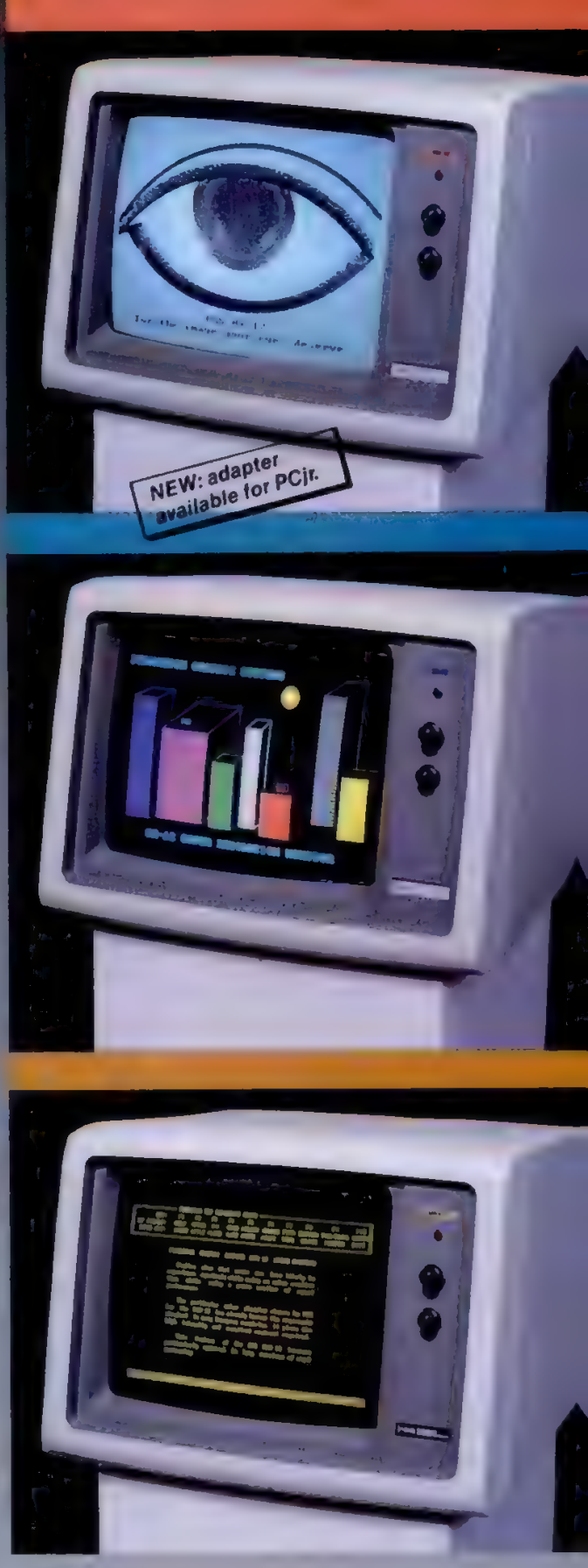
The new SR-12, in conjunction with the PGS high performance color graphics card, also features a .31mm dot pitch supporting 690 horizontal resolution. However, by increasing the horizontal scan rate to 27.5 KHz, the SR-12 can support 400 vertical resolution in non-interlaced mode. This results in a very high quality, flickerless image with the ability to generate graphics and text that is truly of monochrome quality. **Suggested retail price: $799.**

The new MAX-12 offers you easy-on-the-eyes amber with 720x350 resolution at a suggested retail price ($249) that is actually lower than the leading green-on-black competitor. And the MAX-12 runs off the IBM PC monochrome card—no special card is required.

Clarity of the Max 12 is enhanced by dynamic focusing circuitry which ensures sharpness not only in the center but also in the edges and corners. **Suggested retail price: $249.**

Whatever your needs, from word processing to super resolution graphics, there's now a no-compromise PGS monitor that sets the standard. Ask your dealer for a demonstration and let your eyes decide. Or call for more information and the name of your nearest dealer.

You can look to PGS for the image your eyes deserve.



800-221-1490

CIRCLE 299 ON READER SERVICE CARD

Princeton Graphic Systems
An Intelligent Systems Company

1101-I State Road
Princeton, New Jersey 08540
609 683-1660 TLX 6857009 PGS Prin

Now available at Computerland, Entré and local independent computer dealers. Nationwide service provided by Bell and Howell Service Company and MAI Sorbus Service Co.

BOOK REVIEW

Apart from the myopia of a title that equates PC with IBM, this book delivers on more book-jacket promises than any other I've seen. I'd call it the best review book there is—if I didn't know that there are a few creeping around that I haven't read.

The book contains long, detailed, readable discussions of 293 programs and 65 games that run on the IBM PC (and on compatible machines or under MS-DOS). Business, word processing, spreadsheet, database management, graphics, educational, utilities, and personal programs are included, with a comprehensiveness that would be numbing if hundreds or thousands of dollars weren't riding on the effort. The kind of pressure that the crowded marketplace puts on my pocketbook makes me welcome such conscientiousness.

The reviews, which average a thousand words in length, rate documentation, vendor support, error handling, ease of use, reliability, visual appeal, and the value received relative to the cost. Utilities are also rated on their usefulness and educational programs on their educational value. The ratings take the form of grades from A to F with pluses and minuses, and an overall rating is calculated for each product via some unspecified formula. The games, of course, are rated by other pertinent factors and are given much briefer reviews.

While the grading seems to be fairly consistent throughout, it may be a bit too lenient: Of the more than 3,000 grades issued by the 58 reviewers, there are fewer than ten Fs.

While this collection of evaluations is more comprehensive and useful than other compilations, clearly it does not describe every PC program. Peter McWilliams' *Word Processing on the IBM*, identifies 56 word processing programs that will run on the PC; here only 25 are evaluated. These 25 span the market, but among the 31 missing programs are Microsoft *Word*, *Perfect Writer*, and *Muse*. Presumably such omissions will be addressed in the updates that will pop up between the planned annual revisions of this book.

1984 Microcomputer Market Place: A Comprehensive Directory of the Microcomputer Industry
New York: Dekotek, Inc.,
517 pages, paperback, $75.00
ISBN: 0-911255-01-X

The prototype for this reference book is R.R. Bowker's *Literary Market Place*

SOFTWARE ADVISOR'S
telesoft
CALL TOLL FREE 1-800 IBM ONLY

Order Line: 1-800-426-6659 • Order Processing & Other Information 602-224-9345 • Order Line Hours: Mon-Fri 8:30 - 5:30 Saturday 9-1
Address: 1943 East Indian School Road • Suite 194 • Phoenix, Arizona 85016

Prices reflect a 3% to 5% cash discount. Shipping $3.00 per order.
Send cashier's check or money order. All other checks will delay shipping two weeks.
Prices & availability subject to change without notice.

SOFTWARE SPECIALS

d BASE II	$289	WORD PERFECT	$249
LOTUS 1-2-3	$305	THE WORD W/MOUSE	$289
VOLKSWRITER DELUXE	$165	TOBIAS' MANAGING YOUR MONEY	$119

WORD PROCESSORS
Broderbund
Bank Street Writer ... $ 48
Information Unlimited
Easy writer II w/Spell & Mail ... 195
Micropro
Wordstar w/Tutor ... 230
Microsoft
The Word ... 229
Professional Software
Word Plus w/Boss ... 345
Satellite Software
Personal Word Perfect ... 115
Software Publishing
PFS: Write ... 81
PFS: Proof ... 58
Softword Systems
Multimate ... 269

COMMUNICATIONS
Microstuf
Crosstalk XVI ... $105
Software Publishing
PFS: Access ... 89
Wolf Software
Move-It ... 89

SPREADSHEETS
Microsoft
Multiplan ... $129
Software Publishing
PFS:Graph ... 81
PFS: Report ... 71
Sorcim
Supercalc 2 ... 149
Supercalc 3 ... 210
Visicorp
VisiCalc IV ... 155

UTILITIES
Funk Software
Sideways ... $ 39
Peter Norton Utilities
Norton Utilities 2.1 ... 52
Rosesoft
Prokey 3.0 ... 79

TRAINING
American Training Institute
ATI for IBM ... $ 49 ea.
Cdex
Cdex for IBM ... 43 ea.
Davidson & Assoc.
Speed Reader II ... 45
Lightening
Mastertype ... 30
Simon & Schuster
Typing Tutor III ... 30

INTEGRATIVE SOFTWARE
SPI
Open Access ... $329
VisiCorp
VisiOn ... 65
VisiOn Calc ... 249
VisiOn Graph ... 129
VisiOn Word ... 249
VisiOn Mouse ... 165

DATA BASE MANAGEMENT
Alpha Software
d Base Manager II ... $165
Applied Software Technology
Versaform (PC & XT) ... 235
Ashton-Tate
Friday! ... 169
Condor Software
Condor III ... 339
Fox & Geller
Quickcode ... 165
Harvard Software
Harvard Project Mgr ... 239
Living Videotext
Think Tank ... 119
Main Street Software
Main Street Filer ... 179
Micro DB Systems
Knowledgeman ... 275
Microrim
R Base 4000 ... 275
Clout ... 130
Software Publishing
PFS: File ... 81
Stoneware
Advanced DB Master ... 347

MONEY MANAGEMENT
Continental
Home Acct Plus ... $ 85
Mongram
Dollars & Sense ... 96

LOOK ★ LOOK ★ LOOK

SOFTWARE ADVISOR'S TELESOFT NOW ON CompuServe & NewsNet 7-24

CIRCLE 128 ON READER SERVICE CARD

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 12-21 DAY SOFTWARE RENTALS† . . .

Join the thousands of buyers who have saved more than $8,000,000.00 on over 25,000 orders in just the last six months.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns including: *AT&T, Barclays Bank, Bell & Howell, Centel, Citibank, Columbia University, Farm Bureau Insurance, Frontier Airlines, GATX Corporation, General Mills, Harvard University, Hughes Aircraft, International Opinion Research Center, Standard Oil of Ohio, University of Chicago, Veteran's Administration Hospitals,* plus thousands of satisfied consulting firms, small businesses, computer clubs, user groups, municipalities, government agencies and valuewise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE
1-800-621-S-A-V-E
In Illinois call (312) 280-0002

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.



PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and rush my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT", a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

193 ☐

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✔) all boxes that apply:

Basic Membership
- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l. per year—with 12 day rentals
- ☐ Games Software Rental Library for $10 add'l per year

Special V.I.P. Membership*
- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l per year—with 21 day rentals

*VIP members receive advance notice on limited quantity merchandise specials

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Exp. Date _____ (mo. year)

☐ Check or money order enclosed for $ _____

Name _____

Address _____ Apt No. _____

City _____ State _____ Zip _____

Telephone ( ) _____

My computer(s) is: ☐ IBM PC ☐ Apple II ☐ TRS-80 ☐ Kaypro ☐ Other _____

Signature _____
(Signature required to validate membership)

Copyright ©1984, PC NETWORK INC.

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES! All software below is priced in IBM-PC format.

GAMES & EDUCATIONAL SOFTWARE
(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale
Avant-Garde *Air Traffic Controller*	$16.50*
Bluebush *Chess (Your Toughest Opponent)*	34.00*
Broderbund *Lode Runner*	19.75*
CBS *Goren-Bridge Made Easy*	48.00*
Epyx *Temple of Apshai*	21.97*
Infocom *Zork I, II, or III*	21.50*
Infocom *Deadline, Witness or Suspended*	27.00*
Microsoft *Flight Simulator*	27.00*
Orion *JBird (QBert Look Alike)*	22.00*
Orion *PCMan (Great Pac Man)*	21.00*
Scarborough *Mastertype*	27.00*
Screenplay *Asylum (works with mono card too)*	15.50*
Sierra On-Line *Frogger*	21.00*
Sierra On-Line *Crossfire*	18.00*
SubLogic *Night Mission Pinball*	24.00*
Spinnaker *Alphabet Zoo*	17.00*
Spinnaker *Delta Drawing*	29.00*
Spinnaker *FaceMaker*	29.00*
Spinnaker *Hey Diddle Diddle*	17.00*
Spinnaker *KinderComp*	17.00*
Spinnaker *Rhymes & Riddles*	17.00*
Spinnaker *Story Machine*	29.00*
Spinnaker *Most Amazing Thing*	23.00*
Virtual Combinatics *Micro Cookbook*	21.00*

BUSINESS SOFTWARE
(Please add $2.50 shipping and handling for each title ordered from below.)

	Wholesale
ATI *How to use MultiMate*	$44.00*
ATI *How to use Microsoft Word*	44.00*
ATI *How to use Lotus 1-2-3*	44.00*
Ashton-Tate *Friday!*	158.00*
Central Point *Copy II PC*	23.00*
Conceptual Instruments *Desk Organizer*	150.00*
Digital Research *CP/M-86*	30.00*
Digital Research *PL/I Compiler*	300.00*
Funk Software *Sideways*	36.00*
Harvard *Harvard Project Manager*	215.00*
Hayes *Smartcom II*	68.00*
Lotus Development *Lotus 1-2-3*	CALL
MicroRim *RBase 4000*	390.00*
Microsoft *C Compiler*	275.00*
Microsoft *Word with Mouse—Latest Version*	260.00*
Microsoft *Multiplan*	165.00*
Microstuff *Crosstalk XVI*	93.00*
Monogram *Dollars & Sense*	85.00*
Multimate Systems *Multimate V3.2*	250.00*
Oasis *The Word Plus*	90.00*
Peter Norton *Norton Utilities*	48.00*
Rosesoft *Prokey Version 3*	74.00*
Satellite Software *WordPerfect*	210.00*
Softcraft *Fancy Fonts*	125.00*
Software Publishing *PFS: File*	74.00*
Software Publishing *PFS: Write*	74.00*
Software Publishing *PFS: Graph*	74.00*
Sorcim *Supercalc 3*	168.00*
SPI *Open Access*	336.00*
Verbatim *Disk Drive Analyzer*	25.00*

HARDWARE
(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh*	CALL	
Apple *Apple //c*	CALL	
Apple *Apple //e*	CALL	
Columbia *Desktop & Portable Systems*	CALL	
Eagle *Desktop PC and Spirit Portables*	CALL	
IBM *PC 2 DSDD Floppy Drives/Color Card/Mono Monitor*	2,157.00*	(48.00)
IBM *Hard Disk 1 Floppy/10Mb Hard Disk/128K/Color Card/Mono Monitor*	2,902.00*	(62.00)
Sanyo *MBC 550 "Lowest Cost MS-DOS System"*	710.00*	(15.00)
Tava *Complete IBM compatable (128K/Color Card/Mon/2 drives*	1,710.00*	(36.95)
Texas Instruments *Professional*	CALL	

DISK DRIVES & CONTROLLERS

Cogito *1/2 Ht Low Power 10MB Winchester W/IBM Controller*	820.00*	(18.00)
IBM *Floppy Disk Controller*	150.00*	(2.50)
Maynard *WS-1 10MB Internal Hard Disk with Sandstar Multi Function Card*	860.00*	(18.00)
Maynard *WS-2 same as WS-1 but with Sandstar Floppy Controller (uses 1 slot)*	960.00*	(20.75)
Maynard *Floppy Controller/Serial Port*	155.00*	(2.50)
Panasonic *Half Height DSDD Drive Pair*	308.00*	(6.92)
Qume *Half Height DSDD Drive Pair (Same as used on IBM Portable)*	350.00*	(7.00)
Tandon *TM100-2 Full Height DSDD Drive*	178.00*	(4.00)
Tallgrass *20MB External Hard Disk with Tape Backup*	2,600.00*	(46.20)
Teac *FD55-B Half Height DSDD Drive Pair*	309.00*	(7.00)

MEMORY CHIPS
All chips guaranteed for life

64K Memory Upgrade Kits (8 Chips)	43.20*	(1.00)
64K Dynamic Ram Chips (Each)	4.89*	(1.00)

MODEMS

Anchor *Mark XII LOWEST PRICE 1200BPS HAYES COMPATABLE EXTERNAL MODEM!*	230.00*	(5.00)
Hayes *Smartmodem 300*	150.00*	(3.60)
Hayes *Smartmodem 1200B with Smartcom II*	308.00*	(2.50)
Hayes *Smartmodem 1200B without software*	288.00*	(2.50)
Rixon *R212A Stand Alone 1200BPS*	335.00*	(8.50)
U.S. Robotics *Password (Compact 1200BPS Extended)*	290.00*	(6.50)

MONITORS

Amdek *Video 300G Composite Green*	110.00*	(3.00)
Amdek *Video 300A Composite Amber*	120.00*	(3.00)
Amdek *Video 310A IBM Type Amber*	130.00*	(3.00)
Amdek *Color II+ RGB Color*	362.00*	(6.00)
Princeton *HX-12 RGB Monitor*	CALL	
Princeton *MAX-12 IBM Mono*	CALL	
Princeton *SR-12 Ultra High Res RGB*	CALL	
Taxan *210 Combo RGB/Composite*	345.00*	(6.00)
Taxan *420 Super High Res RGB Monitor*	430.00*	(9.30)
Zenith *ZVM-123 Green High Res (Consumer Reports Rated Best Buy!)*	75.00*	(2.50)

MULTIFUNCTION CARDS

Apparat *512K Memory Board with OK*	85.00*	(2.50)
Apparat *Combo II w/ser/par/game/clock/shwr*	123.00*	(2.50)
AST *Six-Pack Plus with OK*	285.00*	(2.50)
AST *MegaPlus II with OK*	205.00*	(2.50)
AST *I/O Plus II*	105.00*	(2.50)
AST *Serial/Parallel/Game Port options for any AST Card*	33.00*	(1.00)
Quadram *Improved Quadboard 384K with OK*	187.00*	(2.50)
Quadram *Quadlink (Run Apple Code on IBM)*	405.00*	(2.50)
Tecmar *Captain Multifunction Card with O/K*	300.00*	(2.50)

PRINTERS

Comrex/Brother *CR-II 13CPS LQ Printer*	395.00*	(8.62)
Comrex/Brother *Typewriter Keyboard for CR-II*	150.00*	(3.25)
Comrex/Brother *Cut Sheet Feeder for CR-II*	150.00*	(3.89)
Epson *RX-80*	267.00*	(6.00)
Epson *FX-80*	415.00*	(9.25)
Epson *FX-100*	600.00*	(14.35)
Epson *LQ1500*	CALL	
Epson *IBM-to-EPSON Parallel Cable*	21.00*	(1.00)
NEC *2050 20CPS Letter Quality Printer*	755.00*	(16.53)
NEC *3550 33CPS Letter Quality Printer*	1,480.00*	(31.54)
Okidata *ML92P 160CPS 80 Col Printer*	395.00*	(8.55)
Okidata *ML93P 160COS Wide Platen*	655.00*	(15.00)
Okidata *IBM-to-Okidata Parallel Cable*	39.75*	(1.00)
Qume *Sprint 11/45 45CPS Letter Quality*	1155.00*	(24.00)
Qume *IBM Cable and Interface (required)*	72.00*	(1.00)
Texas Instruments *855 DP/LQ w/Tractor*	710.00*	(15.50)
Toshiba *P-1351 160/100 CPS Draft/LQ Printer*	1,425.00*	(32.00)

VIDEO CARDS

Hercules *Monochrome Graphics Card*	300.00*	(2.50)
Hercules *Color Card with Parallel Port*	CALL	
Persyst *Monochrome Display Card*	200.00*	(2.50)
Quadram *Quadcolor I Color Card*	175.00*	(2.50)
STB *Graphix Plus*	248.00*	(2.50)
STB *Clock Option for Graphix Plus*	30.00*	(1.00)

ACCESSORIES AND SUPPLIES

Brand Name DSDD Diskettes *Guaranteed for Life!!*	20.00*	(1.00)
Curtis *PC Pedestal II*	54.00*	(3.00)
Keytronic *KB5151 Deluxe IBM Keyboard*	186.00*	(4.00)
WP Printer Paper *2600 Sheets Microfine Perfs (Invisible when torn)*	17.00*	(10.00)

***PC NETWORK Members pay just 8% above the wholesale price, plus shipping.** All prices reflect a 3% cash discount. Wholesale prices fluctuate rapidly—all prices in this issue have been prepared 60 days in advance. Please call for latest prices. Minimum shipping 2.50 per order.

†**RENT BEFORE YOU BUY**—*Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 12 (Regular) or 21 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—JUST 20% OF THE MEMBER WHOLESALE PRICE.*

. . . AS A PC NETWORK MEMBER ONLY!

COMPLETE IBM™ PC SYSTEMS

IBM PC STARTER SYSTEM

IBM PC w/64K — $2,147.00* (48.00)
(256K System Board Capacity)
Floppy Drive Controller
2 Double Sided Double Density 320/360K Disk Drives
Quadram Quadcolor I Color Adapter Card
Zenith ZVM123 High Res Monochrome Monitor
and educational software to the most sophisticated business applications.

IBM PC PROFESSIONAL HARD DISK SYSTEM (XT)

IBM PC w/128K — $2,902.90* (62.00)
(256K System Board Capacity)
2 Double Sided Double Density 320/360K Disk Drive
Quadram Quadcolor I Color Adapter Card
Zenith ZV123 High Res Monochrome Monitor
w/Maynard Electronics WS-2 Hard Disk Subsystem:
Combination Floppy/Hard Disk Controller (Uses only 1 PC Slot)
Automatic Hard Disk Boot Feature
10Mb Hard Disk (1½ TIMES FASTER THAN IBM's)
day for a standard PC.
new product announcements. Call for latest prices.

Custom Configurations

SEND US YOUR PC AND WE'LL BUILD IT FOR YOU—We offer this unique service to our members who wish to upgrade their existing PCs with memory, new drives and other components purchased through the NETWORK. Simply send us your PC and for a flat fee of $150 (plus shipping), our technical experts will integrate and completely test all new and existing components. THE NETWORK MAKES IT WORK!

YOUR SYSTEM EXACTLY AS YOU WANT IT—With the NETWORK'S over 20,000 hardware and software products we can configure a system to your exact specifications ALL AT JUST 8% ABOVE THE DEALER WHOLESALE PRICE! Ask our trained consultants about any drive, monitor, multifunction card or any other component which will meet your unique requirements.

Upgrades and Supplies

64K RAM Expansion Kits — $43.20* (1.00)
(9 Chips) GUARANTEED FOR LIFE!

****Multifunction Card** — $125.00* (2.50)
With serial, parallel, game port, clock & software

****RAM Expansion Card/0K** — $85.00* (2.50)
Add up to 512K add'l memory.
Can be combined with above card in one PC slot

****Brand Name Diskettes** — $20.00* (1.00)
DS/DD(box of 10)
GUARANTEED FOR LIFE!
Certified Supplier to IBM

****Letter Quality Printer Paper** — $17.00* (10.00)
(box of 2600 sheets)

prices reflect a 3% cash discount. **PC Network occasionally omits manufacturer's names or product wholesale prices because our prices are so low that we've been requested not to print them!

CALL TOLL FREE **1-800-621-S-A-V-E** (orders and membership only)
In Illinois call (312) 280-0002 validation A193

PC NETWORK

. . . WITH THESE 15 UNIQUE BENEFITS

1 COST+ 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 400 PAGE WHOLESALE CATALOG—Members receive our 400 page wholesale catalog containing over 20,000 hardware and software products for the IBM PC, APPLE and over 50 other popular computer systems. THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY—**ALL PRICED AT 8% above Dealer WHOLESALE.**

3 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possess' in excess of 150 man years of personal computer product experience.

IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—OR IS INCOMPATIBLE WITH YOUR SYSTEM—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.

4 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.

5 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. We maintain a qualified TECH-SUPPORT staff to help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!**

†**6 OPTIONAL BUSINESS RENTAL LIBRARY**—All members can join our BUSINESS RENTAL LIBRARY for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNTED PRICE FOR A 12 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 21 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†**7 OPTIONAL GAME SOFTWARE RENTAL LIBRARY**—The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

8 SPECIAL SAVINGS BULLETINS—THE PRINTOUT—The NETWORK seeks every opportunity to save money for its members. We buy excess dealer inventories, and store bankruptcy closeouts regularly. We then turn around and make this merchandise (only top quality name brand products) available to our members at fantastic savings via THE PRINTOUT, our newsletter and savings bulletins.

9 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

10 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

11 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account (P/O) status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

12 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors. **The NETWORK looks for every opportunity to save you money.**

13 SOFTWARE PUBLISHING ASSISTANCE—The NETWORK reaches tens of thousands of members regularly through its catalog and newsletter. For those of you who have created marketable software we will lend you our clout with our members, software publishers and distributors to get your material evaluated and circulated.

14 MEMBERSHIP SATISFACTION GUARANTEE If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

15 PRODUCT SATISFACTION GUARANTEE **If your are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.**

CIRCLE 535 ON READER SERVICE CARD

(LMP), the phone book of the publishing business. Like its forebear, *Microcomputer Market Place* is straightforward, and exhaustively thorough. Its core consists of 1,947 software publishers' and 206 microcomputer manufacturers' addresses, phone numbers, officers' names, and brief profiles. These listings are arranged in several indexes and supplemented by a wide variety of secondary-services listings. About the only thing it doesn't list are computer book publishers, but you can go to the original *Literary Market Place* for that.

Word Processing on the IBM
Peter A. McWilliams
Los Angeles: Prelude Press (distributed by Ballantine Books, New York).
287 pages. Paperback, $9.95
ISBN: 345-31530-8

The cover of this book offers this accurate self-description: "A special edition of *The Word Processing Book* for owners and prospective owners of the IBM Personal Computer." Had McWilliams been able to individually review the 56 word processing programs whose features he contrasts, or even a significant subset, this would be a rare treasure indeed.

Online Database Search Services Directory
Edited by John Schmittroth, Jr., and Doris Morris Maxfield
Detroit: Gale Research Co.
574 pages. Subscription to two parts (part 2 will appear in August 1984), $75.00
ISBN: 0-8103-1698-6

Descriptions of databases and on-line already exist, such as Cuadra Associates' *Directory of Online Databases* and Gale's own *Encyclopedia of Information Systems and Services*. This new directory goes one step further and lists those organizations, such as libraries and public information firms, that will access databases and conduct information searches for members of the general public, usually for a fee.

If you only knew the expertise you'd need to get exactly the information you want as simply and inexpensively as possible from these big public databases, you'd never dream of doing it yourself. This reference book means that you won't have to. ■

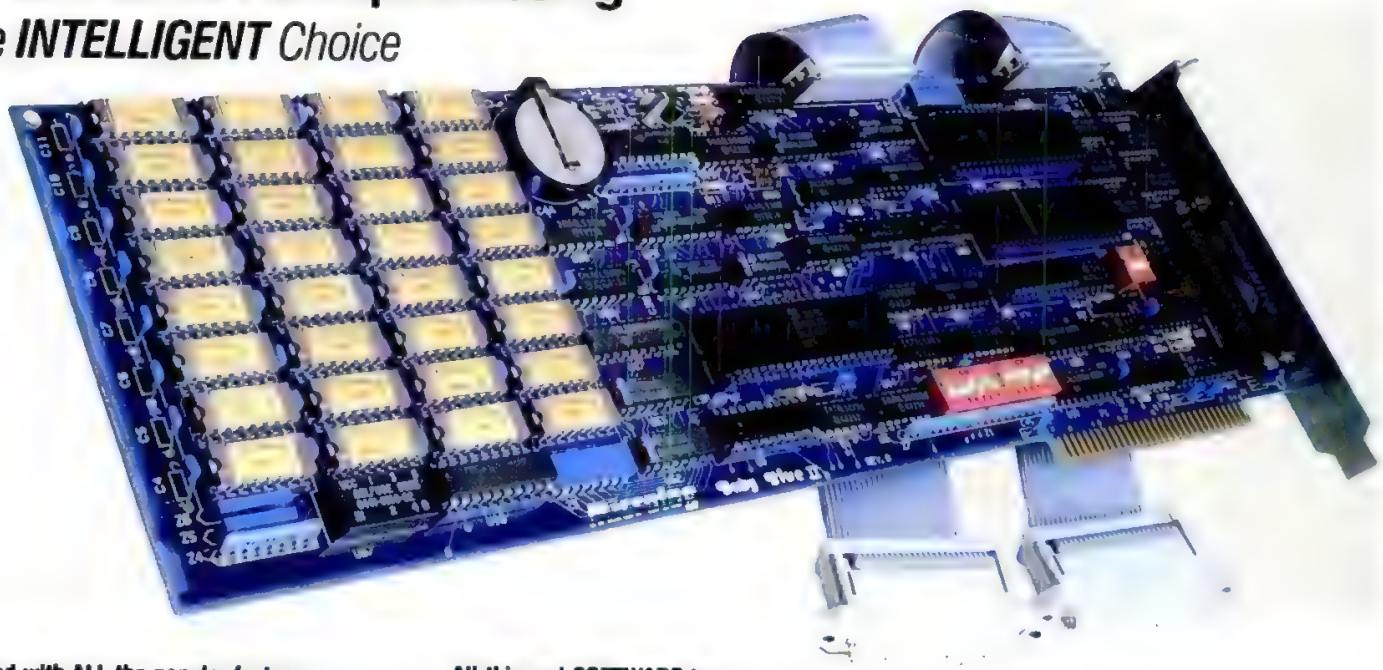
IT PAYS
TO CALL PC WAREHOUSE!
404/432-5555 404/432-5555 404/432-5555

PC WAREHOUSE PC WAREHOUSE PC WAREHOUSE

Baby Blue II

Multifunction/Multiprocessing

*The **INTELLIGENT** Choice*



Packed with ALL the popular features:

- Up to a **256 Kilobyte Memory Expansion**, optional in 64K blocks.
- **Clock/Calendar** with long-life battery back-up (choose replaceable or optional rechargeable battery).
- **Parallel Port** for use with IBM/Epson and most other parallel printers (addressable as LPT1: or LPT2:)
- **Two (2) Serial Ports** addressable as COM1: and COM2:, OR use our unique extended port addressing to configure for serial devices other than COM1: and COM2: (i.e. pointing devices, graphics tablets, etc.)
- **Baby Blue II** is fully compatible with the IBM PC, the PC/XT and other compatibles, including the Texas Instruments Professional Computer.

Not just another DUMB multi-function board.

With all that hardware to manage, we think a board should have a brain. You won't find this feature on other boards – they may look pretty, but they can be pretty boring once you get them home. Baby Blue II is actually a second computer inside your PC, built around the high-speed Z-80B microprocessor.

- **Background Processing:**
  Compile, assemble, sort, calculate, communicate or print – all in the background, while you and your PC continue to work on other tasks in the foreground. Because it is a separate computer, Baby Blue II performs these functions without slowing down your PC, helping you to do more work in less time.
- **Autostart at Preset Time:**
  Baby Blue II can begin any task, even a background operation, at a specific time by consulting the on-board real-time clock.
- **CP/M Capability:**
  Baby Blue II offers instant access to the vast CP/M-80 library of mature, professional software for every conceivable application.
- **Dual Ported Memory and I/O:**
  You can use Baby Blue II's memory, ports and clock as ordinary enhancements to your PC. Or, you can let our Z-80 micro-processor control the board directly, for truly independent back-ground operation.

All this and SOFTWARE too . . .

Systems utilities

PDQ RAMdisk Software: create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

Print Buffer/Spooler: a TRUE print spooler: the Z-80 buffers and manages printing independent of your PC. Unlike other so-called "spoolers", this one won't stop your printer or slow you down when you start another job.

Clock Software: sets Baby Blue II's clock and initializes the system clock at boot time – never type the time and date again!

Communications

Smart Terminal Emulator Package (STEP): talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (the standard package includes Televideo 950 and Hazeltine 1500.
IBM 3101, DEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your configuration is a keystroke away.

BSTAM File Transfer Utility: Transmit and Receive text, HEX, and binary files (including .COM files) without errors and without fuss. BSTAM is easy to use, with all configuration parameters handled transparently under STEP.

CP/M-80 compatibility

Baby Blue Conversion Software: Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands – freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

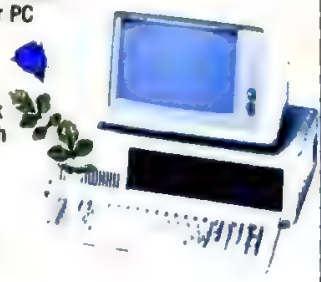
Convert: supports bidirectional file transfer between PC-DOS and popular CP/M disk formats.

Keyfix: automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K installed) . . . . . **$ 695.**

QUALITY you can count on . . .

Microlog is in the business of producing high quality, intelligent computer peripherals. Extensive factory testing gives our products one of the highest reliability rates in the industry. The finest components, connectors, and multi-layer PC board design, ensure years of trouble-free operation. We back all our products with a 90 day warranty and full technical support.
For more information on Baby Blue II and other fine Microlog products, see your microcomputer dealer or contact us:



Microlog™
A TU INTERNATIONAL COMPANY

Microlog, Inc.
222 Rte. 59
Suffern, NY 10901
(914) 368-0353

CIRCLE 516 ON READER SERVICE CARD

Baby Blue II is a trademark of Microlog, Inc.
CP/M is a registered trademark of Digital Research, Inc.
BSTAM is a trademark of Byrom Software, Inc.
IBM is a trademark of you know who.
©1983 Microlog, Inc.

AST brings you the perfect 4-5-6 for your Lotus™ 1-2-3.



Introducing the MonoGraphPlus™ Graphics Card.

Lotus 1-2-3™ is probably the most-used productivity software around. The trouble is, you can't display 1-2-3 graphs on your IBM monochrome display.

That's why AST developed MonoGraphPlus™ for the IBM PC and XT. It replaces IBM's monochrome card, permitting high-resolution bit-mapped graphics and text on the monochrome display.

But our MonoGraphPlus gives you much more. While Lotus offers three useful programs (1-2-3) in one software package, MonoGraphPlus gives you three additional hardware features (4-5-6) on a single card: a printer port, a serial port, and a real-time clock-calendar. Our comprehensive documentation will even show you how to get an extra two lines of text on your screen.

So now you can produce high-resolution, flicker-free graphics without giving up the high-quality text display that makes IBM's green monitor so popular. You can also expand your PC's memory with our MP series of memory cards, turning your PC into an even more powerful workstation capable of producing very large spreadsheets with instant charts and graphs.

Leave it to AST to offer yet another state-of-the-art enhancement product for the PC. You see, we're the world's leading supplier of enhancement products for the IBM PC, offering a complete family of multifunction cards, communications emulators, and local area network products.

To get the perfect 4-5-6 for your PC see your local computer retailer, or contact AST Research Inc., 2121 Alton Ave., Irvine, CA 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

IBM is a trademark of International Business Machines Corp
Lotus and 1-2-3 are trademarks of Lotus Development
MonoGraphPlus is a trademark of AST Research, Inc

MonoGraphPlus Graphics Card

CIRCLE 103 ON READER SERVICE CARD

Balancing Act

Earnings on account balances are a large source of profits for banks, but are subject to changes in interest rates. A PC and a spreadsheet can help find the proper minimum balances.

Providing services such as money transfers, letters of credit, and foreign exchange creates a thorny planning problem for commercial bankers. They not only must make a profit on these services, but must also remain competitive. What makes it so difficult is that banks generally do not directly charge commercial, industrial, and institutional customers for these types of services. Instead, customers are required to maintain minimum balances in demand deposit accounts, and the earnings on these balances are used to pay for the services provided. The income left over becomes a large and essential source of profit.

Unfortunately, the amount of income earned by these balances, and thus the amount of the bank's profit, depends on variable interest rates that are beyond the bank's control. Moreover, the bank cannot continually change minimum balance requirements every time interest rates change. The requirements must remain relatively constant, and customers must be given ample warning of any changes. An accurate planning model is one way to make order out of this chaos and ensure that a bank's compensating balances—and its profits—remain at the proper level: a perfect challenge for a PC and an electronic spreadsheet such as *1-2-3*.

A successful business forecast must indicate how possible future events will



affect the business. This is the classic "what-if" simulation. I have used *1-2-3* to create a prototype of a hypothetical business plan for a commercial bank (see Figure 1). The plan focuses on the interaction of interest rates, service volume, and minimum balances, since this is the most volatile and hard to predict area of a bank's profitability. Although conceptually simple, this model-in-progress is a powerful tool for analyzing these interactions, and it effectively demonstrates the uses of microcomputers in business planning.

Column A in Figure 1 shows typical business plan categories for a commercial banking division. (The types of loans, services, and expense categories were limited to keep the worksheet readable.) Column B contains the entry as it appears on the screen, and Column C indicates the formula or data that would be inserted into the corresponding cell in Column B.

The rate assumptions in Rows 4, 5, and 6 are at the heart of the simulation. They will have the major impact on the bottom line. The "Prime Rate" (Row 4) is the basis for some lending rates to commercial customers. Many loans are tied to the prime rate. The "Marginal Funds Rate" is the rate the bank will have to pay for funds it lends. The "External Funds Rate" is another pricing rate.

The loan volumes in Rows 9, 10, and 11 represent the projected category totals that the division expects for the year. (These three categories were chosen for the prototype because together they make up the lion's share of bank loan income.) The numbers in these rows are negotiated by the lending officers (who are responsible for generating the business) and senior management (who want to expand the volume of business). The numbers are likely to be changed many times.

Service volumes in Rows 14–17 represent the number of money transfers, letters of credit, account services items, and so on that the division expects its customers to use. Like the loan volumes, these numbers are projections that will go through many iterations; they are formed by com-

Illustration: Michael Ng

bining extrapolations from the previous year, senior management's growth goals, and other influences.

The income categories are found in Rows 20–22 for loans and Rows 23–26 for services. Each loan category is the product of the loan volume for that category and a particular interest-rate spread. On fixed-rate loans (Row 20) this is the spread between the fixed rate the bank gets and the bank's current cost for funds, that is, the Marginal Funds Rate (B5). The income on floating-rate loans (Row 21) is the spread between the Prime Rate it charges (B4) and the Marginal Funds Rate. Finally, the income on matched-fund loans (Row 22) is the spread between an average outside rate it charges, the External Funds Rate (B6), and the Marginal Funds Rate.

The income from each of the services shown is the product of the respective service volumes (shown in Rows 14–17, Column B) and unit prices, Column D in Rows 14–17.

Balances

The next group of items, Balances, is crucial for *real* (as opposed to *theoretical*) profitability. Since most loans are automatically tied to changing interest rates, loan income depends primarily on volume, but covering the expense of providing bank services depends on a combination of balances (minus the 16.5-percent reserve that regulations require banks to keep on deposit) and the return the bank can earn on these funds.

The formula for calculating required balances for each service, which appears in Rows 31–34, is arrived at as follows: The yearly revenue from balances is the external funds rate times the balances reduced by the amount of the reserve requirement, or (1 – reserve requirement) × balances. (Note that these services are merely a random sample of services banks perform.) Solving for the balances results in the formula.

If interest rates decline, then larger balances are required to pay for the same amount of services. For example, if the amount that has to be earned on the compensating balances is $100 and the interest rate is 10 percent, a balance of $1,000 will earn that $100. If the rate drops to 5 percent, a balance of $2,000 would be required to produce the same $100.

In bank business planning, therefore, it is important to be able to quickly see not only the impact of a change in interest rates on loan income, but also on the level of customer balances required to pay for the services the customer is using.

When interest rates fall, bank management must ensure that customers paying for services with compensating balances sufficiently augment their demand deposit balances. Using a planning model such as this one enables the manager to project not only what loan income is obtainable but also what level of minimum balances are likely to be required under varying interest rate conditions. Using the model as a monitoring tool will alert line managers to the need for new minimum balances during periods of falling interest rates. ■

Hannah Blank is vice-president in charge of Management Information Systems at Chase Manhattan Bank. She has been working with computers for almost 20 years and is the author of Mastering Micros, *a how-to guide for business executives and managers.*

	A	B	C	D	E	F
1	BANKING DIVISION BUDGET					
2						
3	Rate Assumptions:				Reserve Reqt:	
4	Prime Rate	12.00	12.00		0.165	
5	Marginal Funds Rate	11.50	11.50			
6	External Funds Rate	11.57	11.57			
7						
8	Loan Volumes:					
9	Fixed Rate Loan Volume	50	50			
10	Floating Rate Loan Volume	2200	2200			
11	Matched Funded Loan Volume	2600	2600			
12						
13	Service Volumes:				Prices:	
14	for Acct Services	100	100		50.00	
15	for Money Transfer	700	3000		4.50	
16	for Cash Management	200	200		2.40	
17	for Letter of Credit	50	50		10.00	
18						
19	Income:					
20	NII fixed rate(9.00)loans	-100.0	+B9*(9.5-B5)			
21	NII floating rate loans	1100.0	+B10*(B4-B5)			
22	NII matched funded loans	182.0	+B11*(B6-B5)			
23	Account Services	5000.0	+B14*E14			
24	Money Transfer	3150.0	+B15*E15			
25	Cash Management	480.0	+B16*E16			
26	Letters of Credit	500.0	+B17*E17			
27	TOTAL INCOME	10312.0	@SUM(B20..B26)			
28						
29	Balances:					
30	for Acct Services	69281.4	+B23/(1-B7)*B6			
31	for Money Transfer	36445.5	+B24/(1-B7)*B6			
32	for Cash Management	5553.6	+B25/(1-B7)*B6			
33	for Letter of Credit	5785.0	+B26/(1-B7)*B6			
35	Controllable Expenses:					
36	Salaries, Benefits	350.0	350.00			
37	Travel & Entertainment	35.0	35.00			
38	Supplies & Telephone	22.0	22.00			
39	Premises,Utilities,Deprec	18.0	[illegible]			
40	Operations Costs:				Unit Costs:	
41	for Acct Services	4500.0	+B15*E42		45.00	
42	for Money Transfer	3010.0	+B16*E43		4.30	
43	for Cash Management	400.0	+B17*E44		2.00	
44	for Letter of Credit	495.0	+B18*E45		9.90	
45	TOTAL EXPENSES	[illegible]	@SUM(B37..B40)+@SUM(B42..B45)			
46						
47	PROVISION FOR LOAN LOSSES	100.0	100.00			
48						
49	RESULTS BEFORE OVERHEAD					
50	AND TAXES	1382.0	+B27-B45-B47			

Figure 1: *An abbreviated example of a business plan for a commercial banking division.*



Ash·ĕr:™

1) The only efficient way to combine the personal computer and your office telephone. The first truly integrated work station. See **PRODUCTIVE.** **2)** The only system featuring single keystroke shift between phone functions and other applications programs. See **VERSATILE.** **3)** Displays Phone Directory, Speedial, Calendar and Card File. Works with virtually any phone system. Including your home's. See **USEFUL.** **4)** An easy-to-use format that guides you step by step through a full range of functions. See **FRIENDLY.** **5)** The newest way to do something novel at a work station: Work. See **PRACTICAL.** **6)** A single footprint. Eliminates desktop clutter—a single drop-in card works with the IBM PC® and other compatible systems—and your own existing applications software. See **ECONOMY.** **7)** All of the above. See **ASHER.™** Call **1-800-323-1717*.**

ASHER consists of a printed circuit board that installs in any available option slot on the IBM PC® system board, a 5¼" diskette containing the controlling software, a handset and line cords, and user's manual. ASHER is a trademark of Wilcom, Inc., 1009 Mansell Road, Roswell, GA 30075.

IBM and IBM PC are registered trademarks of International Business Machines, Inc

*Except in Alaska and Hawaii. In Illinois, call 1-800-942-8881.

Asher™

CIRCLE 138 ON READER SERVICE CARD

More PC Enhancements

ACP Key Values for your IBM PC™ and compatible computers



- **The Only PC Intelligent Modem that allows you to switch from Voice to data Communications.**

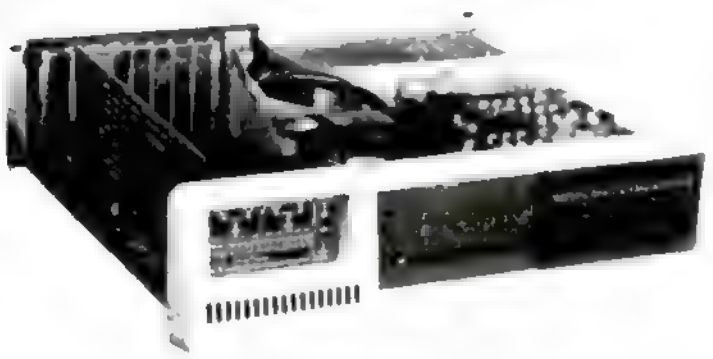
Most MODEMS will let your computer talk. The Bizcomp 1200 Baud MODEM allows you to transfer files and verify via telephone that they were properly received. You just plug your regular telephone handset into the back of your IBM PC/XT™

PC Intellimodem 1200 $439.00

- **10M Byte Hard Disk for the IBM PC.**

Now you can add 50% more capacity than the XT.™ Just plug it in and it is ready to run. It is compatible to both the PC and the XT. Comes complete with controller card, data cable and internal mounting hardware. Requires no special software and will boot directly under DOS 2.0 ™

Internal 10M Byte Hard Disk with Controller $995.00

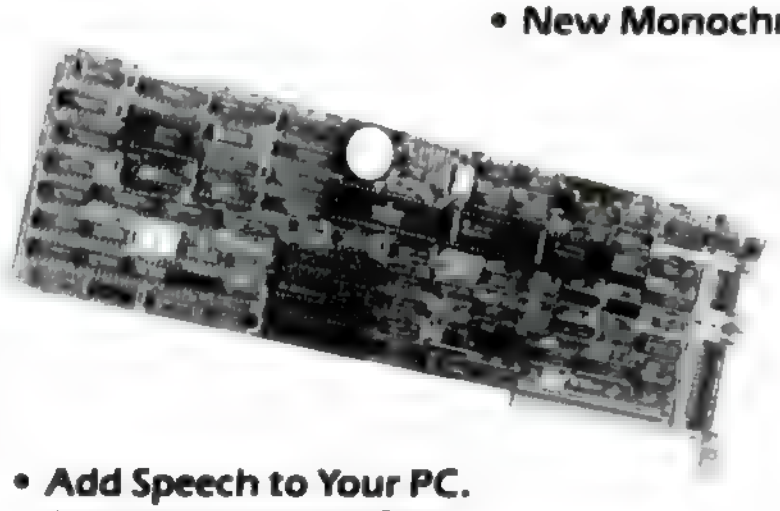


- **DYNAFRAME Hard Disk with Back-up Option and Expansion Slots.**

The DYNAFRAME by Vista is the ultimate add-on device for the IBM PC. If you are ready to add Hard disk to your IBM PC this is the optimum solution. We are offering the minimum configuration which consists of the DYNAFRAME IBM PC matching chassis, 10M bytes of Hard Disk and Controller, 130 watt switching power supply, and eight slots of expansion capability. If you desire back-up can be added later, either the Syquest Removable Hard Disk or the Cipher cartridge data streamer. This product is constructed with the highest quality possible — it is much more than a sheet metal box with a drive thrown in.

DYNAFRAME with 10M Bytes $2499.00

- **New Monochrome Graphics Board from AST.**



AST has the Optimum Solution to Lotus 1-2-3 grapics on the IBM PC Monographic Monitor. It increases the resolution from 640x200 to 720x348 and eliminates eyestrain caused by the IBM graphics adapter. You also get a parallel printer port, clock/calendar w/battery back-up and options include serial port. Now in stock at ACP

AST MonoGraphic Plus $445.
Optional serial port add $35.00

- **Add Speech to Your PC.**

For the past several years Street Electronics has been the leading manufacturer of speech products. Their ECHO™ Speech technology is now available in the CRICKET™ The CRICKET has an RS-232 Serial Interface. Compatible with the PC and PCJr. Software included creates sound effects, music, natural voice, (over 700 words supplied) and Robot voice. It has its own speaker and jack for headphones or stereo. The CRICKET is also compatible with the "Music Construction Set" by Electronic Arts

Cricket for PC or PCJr. $135.00

- **MISCELLANEOUS**

PTI
Back-up power supply up to 30 minutes stand-by power
Compatible with most micros **$328.00**

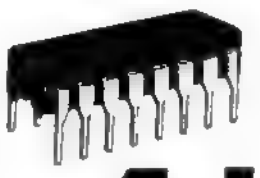
TRANSEND
PC Modem card 1200 Baud **$439.00**

PROMETHEUS
ProModem 200/1200 Baud **$469.00**

VERBATIM
5¼ Head Cleaning Kit **$ 10.95**
Disk Drive Analyzer **$ 29.00**

TITAN
Accelerator PC
(8086 plus 128K Ram) **$745.00**

ERGO-VISION
Anti-glare screen. We have evaluated several and this screen gets top rating for the IBM **$ 39.95**



64K rams

Set of 9 only $50.

- **Best Bargain Yet for Top Quality Color Monitors!**

SANYO

13" Color RGB Monitors with Audio. Ideal for IBM PC and compatibles. Both models have selector switch to turn your color monitor to green only. Take your choice of medium resolution with 5MHZ, 340x230 dots and 1000 character display. Or High Resolution with 7MHZ, 480x240 dots and 2000 character display

Sanyo 6500 Medium Resolution $269.00
Sanyo 7500 High Resolution $389.00

ORDER NOW.

30 day money-back trial
We have no surcharges for Visa or Mastercard. One Day Service Available.
Add 3% Shipping and handling for UPS
Retail prices may vary. California residents add 6% Sales Tax

(800) 854-8230
Toll Free or
(714) 558-8813

ADVANCED COMPUTER PRODUCTS

1310 E. Edinger-Unit P
Santa Ana, CA 92705
TWX 910 595 1565
Since 1976

*All brand names are trademarks

CIRCLE 114 ON READER SERVICE CARD

For Crowded Courts: PC Spells Relief

The Third Judicial District in upstate New York has embarked on a pilot project to test how the PC can be used to help ease the load of paperwork burdening the court system.



Illustration: Philip Anderson

Confronted by escalating caseloads of criminal and civil litigation coupled with budgetary restrictions from fiscally strapped governments, judges and court administrators are in desperate need of relief. With no money to hire additional staff, New York State's sprawling Third Judicial District is experimenting with a less traditional form of workload relief—IBM PCs. A pilot project has already put three PCs in courthouses, and ten more are scheduled to come on-line by the end of 1984.

The district uses dual-drive PCs with 640K RAM, Zenith monochrome monitors, and Epson FX100 dot matrix printers. One PC is installed in Albany County Supreme Court, which handles major civil cases; one in Rensselaer County Family Court, which handles domestic and juvenile cases; and one in the district's central administrative office. The administrative installation also includes two dumb terminals: A Paradyne terminal transmits statistics to the state Office of Court Administration mainframe in New York City while an IBM terminal processes vouchers for payment through the state comptroller's mainframe in Albany.

New York's seven-county Third Judicial District is headquartered in Albany and runs along the state's eastern edge. Bordering on Vermont, Massachusetts, and Connecticut, it mixes urban, suburban, and rural areas. When all 13 PCs are in place, the project will be able to test their court-related applications in a variety of settings, ranging from high-volume municipal police and traffic courts through the county-level tribunals that handle the most serious criminal and civil cases.

Order in the Courts

The PCs won't decide cases, of course. The aim is to use them to handle the mounting tide of paperwork that inevitably accompanies increasing court caseloads: scheduling, budgeting, case management, inventory control, database management, networking, report generation, word processing, and personnel.

Computerization is the logical alternative to hiring more staff, according to David Sullivan, executive assistant to District Administrative Judge Edward Conway. Gloria Beattie, the district's court analyst, said, "Because the Legislature did not authorize any new positions, we decided to go with the PCs and to use the staff we have." Sullivan explained, "We hope automation will give the clerical staff more time and give judges more discretion in managing their own caseloads. Obviously we have no control over our input. We can't tell someone not to file a lawsuit. We can't control the crime rate.

"We want to assist the courts and judges in case management," Sullivan contin-

COMPU MAIL



★ indicates NEW LOWER PRICES

AD#786

PRICE WAR

★ IBM PC 64K, Two disk drives 360K each, Drive Controller and Keyboard $2,199

WE CUSTOMIZE IBM PC SYSTEMS

★ IBM PC with 128K, one floppy Drive, Keyboard 10 MB Hard Disk with Controller $3,199

TAVA PC	CALL
Computer Accessories Power Director	$109
NEW QUADRAM Quadboard OK	$219
★ AST SIX PAK PLUSwith 64K	$266
AST I/O Plus with Clock & Serial Port	$129
ORCHID TECH PCnetPLUS	CALL
TEAC 55B-slimline DSDD	$179
TEAC 55F-slimline DSQD	$249
CONTROL DATA - full height	$219
TANDON 100-2	$209
MAYNARD 10MB - WS-1 with EPROM	$999
MAYNARD 10MB - WS-2 with EPROM	$1,199
TALLGRASS TECH Hard Disk Systems	CALL
★ PGS HX-12	$466
PGS MAX-12 Amber	$179
PGS SR-12	$599
AMDEK 300	$149
SANTA CLARA SYSTEMS PCterminal	CALL
EPSON FX-80	$529
★ EPSON FX-100	$666
OKIDATA Microline 92 P	$429
OKIDATA Microline 93 P	$699
PLUG 'N PLAY for OKIDATA	$49
Printer Stand Regular	$25
Parallel Printer Cable	$30
★ NEC SPINWRITER 2050	$888
★ NEC SPINWRITER 3550	$1,666
★ NEC SPINWRITER 7730	$1,888
PERSYST Color Graphics Card	$209
QUADRAM Quad Color I	$209
QUADRAM Quad Color II Upgrade	$209
MYLEX Multidisplay Card	$499
STB GRAPHIX PLUS	$399
TECMAR Graphics Master	$499
AST MonoGraphPlus with Clock, Serial & PP	$499
HERCULES Graphics Card	$369
Tseng Labs UltraPAK	$549
★ PLANTRONICS ColorPlus	$366
PARADISE Multidisplay Card	$379
MICROCOM ERA 2 Internal Modem w/Software	$349
HAYES Smartmodem 1200 B	$399
HAYES Smartmodem 1200	$499
EVEREX Graphics Edge	$399

MasterCard AMERICAN EXPRESS VISA

VISA & MC 3%- AMEX

COMPUMAIL

805-498-6635

2509 THOUSAND OAKS BLVD THOUSAND OAKS CA 91362

CIRCLE 234 ON READER SERVICE CARD

ued. For example, a case-management system could track all open cases, earmark those pending longer than judicial guidelines allow, and determine which attorneys are handling which lawsuits. That information will help locate problems, provide more flexibility to individual judges in scheduling their cases, and give the administrative judge "more flexibility in scheduling judges," Sullivan said.

The district's PCs are now being used to:

- Generate the myriad of reports required by the Office of Court Administration and other government agencies, including reports on changes in a criminal defendant's legal status, on bail payments in the court's safekeeping, and on the number and types of cases processed by each judge and court.
- Calendar cases for hearings and trials, a process previously done manually.
- Maintain personnel files on the district's 313 judges and nonjudicial staff. Those employment records contain civil service information, so personnel officers know when an employee with provisional status must be replaced by someone from a competitive examination list.
- Schedule the district's 15 Supreme Court stenographers who record and transcribe court proceedings.
- Inventory $20,000 to $30,000 worth of centrally purchased supplies annually. The system monitors orders and distributions, then allocates the costs to the appropriate court's budget.
- Process the approximately 7,000 vouchers that are paid each year.

Looking Ahead

The district has not yet fully tapped the PC's capabilities for court management and operations. Sullivan plans to network the micros and develop a tracking system

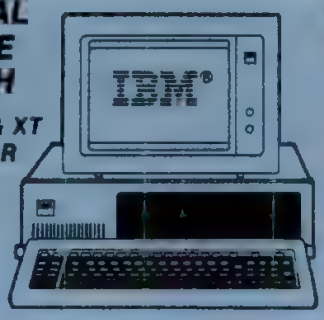


David Sullivan and Gloria Beattie working at one of the Third Judicial District's PCs.

COMPUTER HUT™

COMPARE OUR SERVICE & PRICE!

SPECIAL OF THE MONTH



IBM-PC & XT CALL FOR PRICE

Tandon TM100-2 DS/DD $225
PANASONIC JA 551
SHUGART SA-455 half-high BEST
TEAC FD-55B Slimline PRICES
AMDEK half-high
HITACHI half-high

MAYNARD ELECTRONICS
Floppy Disk Controller $169
FDC w/Par. Port $219
FDC w/Ser Port $239
SANDSTAR SERIES CALL

QUADRAM
Quadboard-PP,SP,C/C,Mem + s/w
Expandable to 384K ..... CALL
Quad 512 + SP,Mem with s/w
64K $249
Quadcolor ..... CALL

AST RESEARCH
MegaPlus II 4-Funct 64K + s/w $279
6-Pack 5-Funct 64K + s/w $279
I/O Plus $129

TECMAR
Graphics 720 × 400 16 colors $529

HERCULES
Hi Res Graphics 720 × 348 $359

FREDRICKS ELECTRONICS
COLORPLUS 640 × 200,
16-Color + s/w $399

MA SYSTEMS
PC Peacock w/Par Port $275

MICROLOG
Baby Blue $359
Baby Blue II 64K $575

PARADISE
Multidisplay $395

HARD DISK - IBM-PC & XT

MOUNTAIN — External Syst.
5MB .... $1539 10MB $1799
15MB .... $2309 20MB $2549
20M Tape back up $1695
MAYNARD ..... CALL

PRINTERS

EPSON
FX80 ..... CALL FX100 ... CALL

brother
HR1 A Par $599
HR-15 Par $459
HR-25 ..... CALL

DYNAX
DX-15 Par .... $459 Ser $489

C-ITOH
STARWRITER A-10 CALL
STARWRITER F-10 P $1095
PROWRITER 8510 SP 180 CPS $649

star MICRONICS
Gemini 10X ... $299 15X ... $399

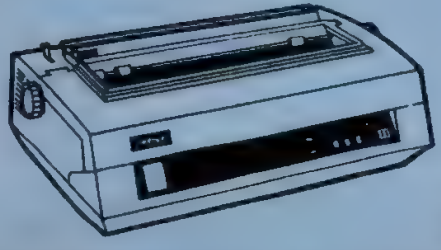
OKIDATA

82A ..... CALL		83A ..... CALL	
84P		84S	
92P	BEST	92S	BEST
93P	PRICES	93S	PRICES

NEC

3510	$1485	7710	$1995
3515	$1479	7715	$2039
3530	$1575	7720	$2495
3550	$1695	7730	$1995
2000 Series		CALL	

TOSHIBA
P1351 ..... $1649
P1340 ..... $849
IDS, DAISYWRITER ..... CALL



MODEMS

HAYES
Smartmodem 1200 $489
Smartmodem 1200B $419
NOVATION, US ROBOTICS CALL

COMPUTERS

EAGLE CALL
COLUMBIA DATA PRODUCTS, INC. CALL
CORONA CALL
TAVA PC CALL
COMPAQ CALL

MONITORS

AMDEK
Video 300G ... $145 300A $155
Video 310A $189
Color II ..... $429 Color II + CALL
PGS
HX12 Hi Res RGB monitor .... BEST PRICES
MAX-12 Hi Res Mono.
SR-12 Super Hi Res RGB



SOFTWARE FOR IBM-PC

Word Perfect $299 WordStar $275
DBase II .... $389 VisiCalc $189
Multiplan ... $175 Multimate ... $299
MICROSOFT Word $269
AND LOTS MORE

CANADIAN COMPUTER HUT
AUTHORIZED DEALER
MICROCONTEXT INC.
5253 AVE DU PARC
MONTREAL
QUE H2V4P2.
(514) 279-7291

Published Prices are for U.S.A. Only
Please call for Canadian Prices

ANY PRODUCT NOT LISTED? CALL

COMPUTER HUT
OF NEW ENGLAND INC.
101 Elm St., Nashua, NH 03060

ORDERS & INFORMATION
(603)889-0666

ORDER-LINE ONLY PLEASE
(800) 525-5012

All products usually in stock for immediate shipment and carry full manufacturers' warranty. Price subject to change — this ad prepared two months in advance. You get the lowest price. We honor personal checks — allow 10 days to clear. COD up to $300 add 3%. Visa, MasterCard add 3%. For shipping & insurance add 3% or $5.00 min. for small items and $10 min for monitors, printers, etc. APO & FPO orders add 12%. Include phone number.

IBM is a trademark of IBM Corp.

Return authorization and order status (603) 889-7625

CIRCLE 115 ON READER SERVICE CARD

— ORDER DESK ONLY —
(800) 272-3360
TOLL FREE IN CALIFORNIA

— ORDER DESK ONLY —
(800) 292-3360
TOLL FREE OUTSIDE CALIF.

"WHY PAY MORE"
COMPARE THESE PRICES
MC-P APPLICATIONS
Brings Software & Hardware At Unbeatable Prices

SOFTWARE

	LIST	OUR
ASHTON TATE		
dBase II	$700	$295
Financial Planner	700	452
Friday	295	175
CONTINENTAL		
Home Accountant	150	105
FOX & GELLER Quick Code	295	174
FUNK SOFTWARE Sideways	60	45
HOWARDSOFT		
Real Estate Analyzer II	250	165
HUMAN SOFT DB Plus		89
LIFEBOAT SYSTEMS		
Lattice 'C' Compiler	500	325
LIFETREE Volkswriter Deluxe		175
LIVING VIDEOTEXT		
Think Tank	195	125
LOTUS — 1-2-3	495	299
MICROPRO Spell Star	250	162
Mail Merge	250	162
Super Sort	250	149
Calc Star	145	86
Info Star	495	320
Word Star Pro w/Correctstar	695	369
MICRORIM R Base 4000	495	325
MICROSTUFF Crosstalk	195	109
MICROSOFT		
Multiplan	250	159
Flight Simulator	50	35
Multitool Word W/Mouse	475	295
Pascal Compiler	350	245
C Compiler	500	325
PETER NORTON		
Peter Norton Utility	80	55
PBL CORPORATION		
Personal Investor	145	98
PEACHTREE Peach Pack	595	249
ROSESOFT Prokey		95
SATELLITE Word Perfect	495	325
SOFTWARE DIMENSIONS		
Accounting Plus GL, AR, AP, PR, INV—Each	599	399
SOFTWARE PRODUCT INTERNATIONAL		
Open Access	595	369
SOFTWARE PUBLISHING		
Pfs:File	140	89
Pfs:Report	125	79
SOFTWORD SYSTEMS		
Multimate	495	275
SORCIM SuperCalc II	295	175
SuperCalc III	395	239
Super Writer	295	205
STATE OF THE ART (FM Series)		
GL, AP, AR, INV, PR—Ea.	595	375
VISICORP Visicalc IV	250	175
Visifile	300	195
VisiTrend/Plot	300	195
VisiSchedule	300	195

Monthly Specials

Tandon TM 100-2
$205.00

AST SIX PAK (64K)
$265.00

AMDEK 310A
$169.00

MULTIMATE
$275.00

IRMA 3270
$1045.00

OPEN ACCESS
$369.00

Value Paks

LOTUS 1-2-3
$299.00

PLANTRONIC + PRINCETON GRAPHIC
$869.00

R:BASE 4000 + MULTITOOL WORD W/MOUSE
$585.00

LOTUS 1-2-3 + HERCULES CARD
$669.00

ORDER STATUS & TECHNICAL SUPPORT — CALL (408) 293-3360

Call for Hardware & Software Prices Not Listed This Ad

Used PC's & Apples Bought & Sold

HARDWARE

	LIST	OUR
HAYES MICROCOMPUTER PRODUCTS		
Stack Smart Mod 300	$289	$199
Smart Mod 1200 B (IBM)	599	429
Smart Mod 1200	699	495
MOUSE SYSTEMS		
P.C. Mouse w/Software	295	219
NOVATION		
J-Cat	149	105
Smart-Cat 103/212	595	445
Smart-Cat 103	249	187
KRAFT & TG JOYSTICKS	70	35
ELECTRONIC PROTECTION DEVICES		
Orange	140	94
Peach	98	64
IBM PC 64K/2 Drives/ Controller Cd.		2169
IBM XT		4295
AST RESEARCH		
Megaplus 64K	395	265
Six Pac Plus 64K	395	265
QUADRAM		
Quadboard II 64K	395	275
Quadcolor I	295	219
Quad 512 + 64K	325	245
Quadlink	680	525
STB COLOR GRAPHIX CARD		375
TANDON		
TM 100-2 Drive	395	205
TALL GRASS		
Hard Disc & Tape, 12 Mgb	3495	2995
TEAC HALF HEIGHT		199
PEGASUS		
Hard Disk 10 Mgb (internal)		1195
PRINTERS		
Epson FX 100		725
IBM Parallel Printer Cable	50	37
NEC 7730 RO Parallel	2595	2295
Okidata 92	699	459
Qume 1140 plus	1685	1525
MONITORS		
Amdek MAI Board	599	459
Amdek 12" 310A	230	169
Amdek Color II RGB Hi-Res	529	399
Hercules Graphics Card	499	359
Princeton RGB Hi-Res	795	485
Plantronics Color Card	595	385
USI PI3	249	149

International Dealer Inquiries Welcomed

CIRCLE 290 ON READER SERVICE CARD

MC-P APPLICATIONS, Inc.
1630 Oakland Road, Suite A-114
San Jose, CA 95131, USA Phone (408) 293-3360
Telex: 821396 MCPA UD
HOURS: 8:30 a.m. to 5:30 p.m. — Mon. - Sat.
Call for Prices in Australia at 02-929-8468

TERMS: All prices subject to change. Cashier's check/MO/Bank Transfer. Allow time for company or personal checks to clear. Prices reflect cash prepaid discount. VISA/MASTER CARD/COD/PO's 3%. California residents add sales tax. *SHIPPING:* $4 per item for UPS surface ($8 for Blue Label); Monitors $20, Printers $25, within continental USA.

so the status of any of the district's thousands of pending cases can instantly be checked. Another possibility is to connect dumb terminals to PCs in the busiest Family Courts to speed data entry. PCs could also interface with the state's mainframes, avoiding the need to enter some data, such as voucher information, twice.

According to Sullivan, one PC also may be used for financial analysis, such as monitoring spending to ensure that each court stays within its appropriations. A spreadsheet program could be used to develop future budget proposals.

Presently there are no plans to install a PC in each judge's chambers, although that remains a possibility, Sullivan said. However, the district does intend to experiment with using word processing software to generate routine correspondence and to prepare judicial opinions.

There are no plans to install a PC in each judge's chambers.

The first three PCs arrived bundled with *VisiCalc* and *PFS:FILE*, but the district's software needs have already evolved, Beattie and Sullivan explained. "We have graduated to more sophisticated software," Sullivan said. Lotus' *1-2-3* is now the district's spreadsheet of choice, while *Advanced DB Master* is the preferred database management package. According to Beattie, *Advanced DB Master* requires "a bit more training on first exposure, but it will do almost anything you want. It's amazing what that program will do." She particularly liked its capacity to program its dedicated function keys as macro keys, speeding the preparation of reports.

The ten new PCs will be scattered throughout the district, primarily in the busiest Supreme, County (felony), Family, and Police Courts. One is also scheduled for the courthouse in rural Greene County in the northern Catskills, where a single judge presides over Family, Surrogate's (probate), and County Courts.

"There are many other smaller courts where a PC would be feasible," said Sullivan, "but first we want to evaluate the first generation." ■



NOBODY BEATS THE SOFTMAN!

WordStar	$235
WordStar Pro Pak	$349
SuperCalc III	$215
EasyWriter II System *(w/speller/mailer)*	$189
EasyWriter I System *(w/speller/mailer for PC jr.)*	$125
R: base	$279

OUR PRICES ARE THE LOWEST!

SPREADS/FINANCIAL		WORD PROCESSORS	
Lotus 1-2-3	$319	Word	$239
VisiCalc IV	$169	Word w/mouse	$289
SuperCalc III	$215	Multimate	$275
EasyPlanner	$125	WordStar Pro	$349
MultiPlan	$155	EasyWriter II Syst	$189
DATA BASES		**ACCOUNTING**	
dBase II	$369	**IUS**	
Condor 3	$357	G/L, A/P, A/R, I/C, O/E ea	$289
EasyFiler	$200	**MBSI**	
R Base	$279	G/L, A/P, A/R, O/E w/IC, Payroll	$375
QuickCode	$175	Sales Analysis	$199

OTHER TITLES AVAILABLE

WE SPECIALIZE IN VOLUME DISCOUNTS



SoftMan

ORDERS ONLY

1-800-821-6023

For Information And In California (415) 332-5515

CIRCLE 453 ON READER SERVICE CARD

ADVANCED COMPUTER PRODUCTS

Serving Computer Professionals Since 1978

TOLL FREE 800-854-8230

IBM PC



★ COLOR SPECIAL ★

THE COLOR GRAPHICS CARD
(same designer as Colorplus Card)

PRICE BREAKTHRU! 1 year Warranty

$269.00 **$269.00**

MULTI CARD II™ (exp. 0K-384K) $199.00

(INTRODUCTORY OFFER)

Advanced Computer Product's best selling multifunction card for the IBM PC & XT (plus compatibles) now has been improved with expansion capability to a full 384K and at no charge an additional game port. You also get Print Spooler and Disk Emulation Software plus a full year SWAP-OUT Warranty at no extra charge. Why pay more when you can get the same function and performance as Quadboard II™ and AST Sixpak Plus™ for substantially less money. You compare! Try it at no obligation. 10 day no questions asked return privilege.

FUNCTION	Multicard II	Quadboard II	Sixpak Plus
Memory	0 to 384K	0 to 384K	0 to 384K
Parallel/Serial	Yes	Yes	Yes
Clock/Calendar	Yes	Yes	Yes
Game Port	Yes	Yes	No ($50 list Opt.)
Software	Yes	Yes	Yes
Warranty	1 Year	1 Year	1 Year
ACP Price with 0K	199.00	229.00	229.00

EXPANSION MEMORY

- **64K Upgrade** (Set of 9 64K RAMS) $50.00
- **256K RAM's** (256K x 1) $79.00
- **16K RAM's** (16K x 1) ..... 10/$9.99
- **8087 CPU** (Arithmetic Processor) $199.00

IO/XT (Serial, Parallel, Clock/Calendar) ... $129.00

The most popular expansion card for the short slot of your IBM XT. All these functions on one card optimized to fit in one slot. 1 year warranty.

COLOR/GRAPHICS/COLOR/GRAPHICS

- Plantronics COLORPLUS™ $399.00
- Hercules GRAPHICS CARD $348.00
- Graphics X Software $42.00
- Quadram QUADCOLOR I&II $199/Call
- Scanoptik COLORGRAPHICS $289.00
- Amdek MAI $438.00
- Hercules COLOR CARD w/Par port $229.00
- Paradise MULTIDISPLAY $378.00
- CONOGRAPHIC CARD $895.00
- MA Sys PEACOCK $297.00

IBM PC COMPATIBLE DISK DRIVES



- **Tandon** TM-100-1 Single Sided (160K) ... $169.00
- **Tandon** TM-100-2 Double Sided (320K) 199.00
- **Control Data** 9409 Double Sided (320K) ... 224.00
- **TEAC*** 55B ½ high Double Sided (320K) 179.00
- **Toshiba*** ½ high Double Sided (320K) 169.00
- *IBM PC Mounting Hardware for ½ highs 4.95
- **Vista** "Diskmaster" 5¼" & 8" Diskcontroller .. 169.00

HARDWARE

- **AST** Sixpakplus w 0K(SPC) $229.00
  - Megaplus II w/0K(SC) 229.00
  - I/O Plus II (CS) 115.00
  - Game/Serial/Parallel Options 35.00
  - Monographics Graphics Card 445.00
- **CHALKBOARD** Call
- **COEX** IBM PC Extender Card 29.00
  - IBM PC Prototype Card 36.00
- **DAVONG** Hard Disk Drives Call
- **KENSINGTON** PC Saver 39.00
- **KEYBOARD** IBM PC Compatible 149.00
- **KEYTRONICS** 5150/5151 199.00/Call
- **KOALA** 96.00
- **KRAFT** or **TG**
  - IBM PC Joystick 59.00
  - Game Paddles 29.00
- **MICROSOFT** Mouse 169.00
- **M&R** PC/XT Exp Chassis (6 slots) 439.00
- **MOUSE SYS** Mouse for PC 195.00
- **PERSYST** Time Specirum w/64K 289.00
- **PTI** Back-up Power 200/400W Call
- **QUADRAM** Quadboard II w/0K 229.00
  - Quadlink (Apple Prog.) 479.00
  - Quaddisk (up to 72Mb) Call
  - Microfazer MP64 w/64K 179.00
- **VISTA** Multicard Plus 0K-384K 199
  - Maxicard w/64K (up to 576K) 229.00
  - PC Master (10 I O) 329.00
  - Diskmaster (Floppy Cont.) 169.00
  - Dynaframe Hard Disk Call
  - PC Clock I/O 129.00

PRINTERS/MONITORS

- **BROTHER** HR-25 (23cps daisy) Call
  - HR-1A (16cps daisy) Call
- **COEX** 80F T (80cps) Sale $199.00
- **DYNAX** DX-15 (daisy, 2-color) 529.00
- **DAISYWRITER** 2000 (17cps) 1049.00
- **EPSON** RX-80 (100cps) 299.00
  - FX-80 FX100 Call
- **NEC** Spinwriter 3550 1668.00
- **OKIDATA** Model 82 83 399.00/619.00
  - Model 84P 84S 919.00/989.00
  - Model 92P 92S 445.00/595.00
  - Model 93P 93S 789.00/899.00
- **SILVER REED** EXP550 (17cps) 588.00
  - EXP770 (30cps) 770.00
- **STAR** Gemini 10X (120cps) 309.00
  - Gemini 15X (120cps) 429.00
  - Delta 10/15 (160cps) Call
- **TTX** Model 1014 (12cps) 329.00
- **TOSHIBA** 1350 Dot Matrix 1549.00
- **AMDEK** Video 300G A 145.00/155.00
  - Video 310A amber (IBM) 159.00
  - Color I (composite) 299.00
  - Color I Plus (earphn/nonglare) 329.00
  - Color II RGB (IBM) analog 449.00
  - Color II Plus 399.00
  - Color III RGB (IBM) 399.00
  - Color IV RGB (IBM) analog 779.00
- **BMC** 12" Green-Low cost 89.00
- **PGS** HX-12 RGB (690x240) 499.00
  - SR-12 RGB (690x480) Call
  - MAX-12 Amber Call
- **ZENITH** ZVM-121 12" green 99.00
  - ZVM-134 12" RGB color 399.00

DISKETTES

DYSAN 5¼" SS DD	10/$55	$2[illegible]
DYSAN 5¼" DS DD	10/65	36
IBM 5¼" SS DD	10/60	4[illegible]
IBM 5¼" DS DD	10/65	47
VERBATIM 525-01 SS DD	10/45	2[illegible]
VERBATIM 550-01 DS DD	10/55	2[illegible]
MAXELL MD1 SS DD	10/50	22
MAXELL MD2 DS DD	10/60	3[illegible]
Flip Storage Box 5¼" (80 disks)		18
BULK SPECIAL SS	10/25	16
With Sleeve and Box	100/195	14[illegible]

IBM ACCESSORIES

- **COMPUCABLE**
  - Keyboard drive dust covers (set) $16.00
- **CURTIS** Tilt swivel Monitor ped 43.00
  - PC Pedestal (IBM Mono) 58.00
  - PGS Quadchrome disp. Adapter 6.00
  - Vertical PC Stand 20.00
  - Mono Extension Cable 43.00
  - Keyboard Ext Cable 35.00
  - AC Plug Adpt (any mon. to PC) 8.00
- **EDP PROTECTION DEVICES**
  - The Lemon Peach 39.00/63.00
  - The Orange/Lime 84.00/58.00
- **DILTRONIX SWITCH BOXES**
  - 2 Way 8 Lines 90.00
  - 4 Way 8 Lines 179.00
  - 2 Way Centronics 199.00

RIBBONS

	Each	Dozen
Epson MX-80	6.75	58.00
Epson MX-100	10.95	120.00
Star Gemini 10-15	2.50	26.00
Okidata 80-82 83	3.95	44.00
Okidata 84-92 93	4.95	55.00
NEC 3550	11.95	136.00

MODEMS

- **BIZCOMP** Model 2120 (Internal) 449.00
- **HAYES** Smartmodem 1200 $475.00
  - Smartmodem 1200B (w Smartcom II) 418.00
  - Smartmodem 300 199.00
  - Smartmodem II 99.00
  - Smartmodem/IBM Cable 25.00
- **NOVATION** Access 1-2-3 388.00

SOFTWARE

dBASE II/Friday
$378.00/$168.00

Condor
$389.00

SuperCalc I/II/III
$79.00/$159.00/$228.00

Multiplan Vers. 1.1
$138.00

Microsoft Mouse/Word
$288.00/$238.00

Wordstar 3.3
$258.00

Micropro Pro Pak
$378.00

Rbase 4000
$328.00

T. K. Solver!
$268.00

PFS
File 88.00 Graph 88.00
Write 88.00 Report 78.00

Context MBA Call
VisiOn Call

Lotus 1-2-3 Vers. 1A
Call!

- Bank Street Writer 58.00
- Home Accountant Plus 88.00
- Sideways 48.00
- Volkswriter 114.00
- Knowledge Man 274.00
- Crosstalk XVI 108.00
- Multimate w/spelling 348.00
- Compuserve Subscription 38.00
- Executive Info Serv. 78.00
- Vidtex Software 58.00
- Executive + Vidtex 118.00
- Source Subscription 68.00
- Source w/source link 108.00

Send for Free Catalog
96 Pages of Selected Values

1984 CATALOG AVAILABLE SOON • 64K UPGRADE KITS - ONLY $50.00

64K UPGRADE - ONLY $50.00 • CUSTOM CABLES AVAILABLE

TERMS We accept VISA, MC, MO. Cashiers and Personal checks. School and Company P.O.'s. We do not charge your card until we ship. Personal checks require drivers license and credit card #. **No Surcharge Added on VISA or MC.** COD's over $500 require 20% deposit with order. Add 3% shipping and handling for UPS. We offer sameday shipment. Prices subject to change without notice. We reserve the right to substitute manufacturer. We are not responsible for typographical errors. **Retail Sale Prices May Vary.** IBM™ trademark of International Business Machines. Quadboard II™ trademark of Quadram Corp. Sixpak Plus™ trademark of AST Research Inc.

MAIL ORDER: P.O. Box 17329 Irvine, CA 92713
Retail: 1310 E. Edinger, Santa Ana, CA 92705
(714) 558-8813
542 W. Trimble, San Jose, CA 95131
(408) 946-7010

TOLL FREE
800-854-8230
TWX
910-595-1565

WE STOCK CABLES • RIBBONS • DISKETTES • SPARE PARTS

CIRCLE 113 ON READER SERVICE CARD

An Eclectic Program Collection

A new "electronic book" from Prentice Hall—a paperback with a floppy disk inside—contains a miscellaneous selection of mathematical, engineering, and graphics programs.

Prentice-Hall, Inc., the international publishing company, is one of several large professional and textbook houses to begin packaging software with its books. I received one of its first fruits, *Science and Engineering Programs for the IBM PC*. This paperback has a sleeve inside the back cover into which the floppy disk fits; I was truly impressed by Prentice-Hall's packaging solution. Voila! The marriage of books and electronics is complete. The book, I presume, will be sold from the shelves in bookstores, just like any potboiler spy story, and can be shipped and received just like any other book.

What this method of packaging does for the long-term health of the floppy disk in the sleeve is another question. I can't help but think, given the dog-eared appearance of even my newer paperbacks, that Prentice-Hall and other publishers should consider putting the disk in the middle of the book, protected in a sturdier sleeve. The added expense of this packaging would be worthwhile.



Science and Engineering Programs for the IBM PC
Prentice-Hall
Route 9W
Englewood Cliffs, NJ 07632
(800) 624-0023
List Price: $29.95
Requires: 64K RAM, one disk drive, graphics adapter recommended.

CIRCLE 800 ON READER SERVICE CARD

The Book

Scientific and Engineering Programs, which is also sold without the disk for $12.95, was written by Cass Lewart, who describes himself as a research engineer in communications and computer science at the System Development Company, in West Long Branch, New Jersey. Both his bibliography and the cover blurb indicate that he is a frequent contributor to such trade magazines as *Computer Design*, *Electronics*, and *Computers and Electronics*. Indeed, four of the programs in the book are drawn from his previous magazine articles.

According to the author, the 19 programs making up this book are designed for the electronics and communications engineer, programmer, college student, and advanced electronic hobbyist. They include graphics generation, number theory, a sprinkling of applied mathematics, probability and statistics, electrical engineering, operations research, and two "miscellaneous" programs called "Azimuth and Elevation for Geosynchronous Satellites" and "Artificial Intelligence Strategy Game." The inclusion of the geosynchronous satellite program struck me as bizarre at first—how many of us have a satellite sitting around, waiting to be shot up by NASA? When I read more closely, however, I found that the program dealt with aiming a private television receiving antenna at an orbiting satellite. A nice touch, if you want to get your cable TV for free, is the inclusion of the longitudes of 12 satellites now hovering over the United States.

The artificial intelligence program is sort of an AI sampler: The program "learns" your strategy in predicting heads or tails in a coin-toss game, and if it matches your guesses, it wins. If your guesses are random, so are its; if you use a strategy, it learns to mimic you.

All of the programs come on one dou-

Illustration: Michael Ng

ble-sided, double-density disk, written for the IBM PC and its compatibles. Both MS-DOS (either 1.1 or 2.0) and BASICA must be booted up before you can use the disk. The author recommends copying MS-DOS and BASICA onto a blank disk, then copying his programs onto that disk. Some of the programs call up other programs on the disk, especially the graphics generator. According to Lewart, if the full capabilities of the graphics generator are to be used, you must have a graphics adapter card.

Here are some of the other programs in the book:

• **Graph Display Routine.** This program, one of the longest (150 lines of BASIC commands) in the book, allows you to construct *x-y* graphs of a group of numbers in either low (320×200 pixels) or high (640 × 200 pixels) resolution. A helpful feature is that the program automatically scales the axes to give you the best representation of the data.

• **Fourier Coefficients of Periodic Functions.** Fourier transformations are functions of great value to scientists and engineers involved in analyzing complex sets of data. The program allows you to enter the formula to which you want Fourier analysis applied and then to graph the results. You specify the number of iterations the program should run.

• **Complex Arithmetic.** With this program, your PC is transformed into a calculator using the "reverse Polish notation" that we all know and love from the days when Hewlett-Packard hand calculators were the engineers' status symbol. RPN, for the uninitiated, uses a "stack" of registers that allow you to carry out mathematical operations and automatically store the result in another register. The routine can be used to analyze complex numbers (those with a real and an imaginary component). The program sets up six registers in the PC and allows you to perform 18 functions with the registers, including square roots or squares, arithmetic, and register-shuffling or register-clearing functions. All six stacks are continuously displayed on the PC screen—a useful way of keeping track of just what is where.

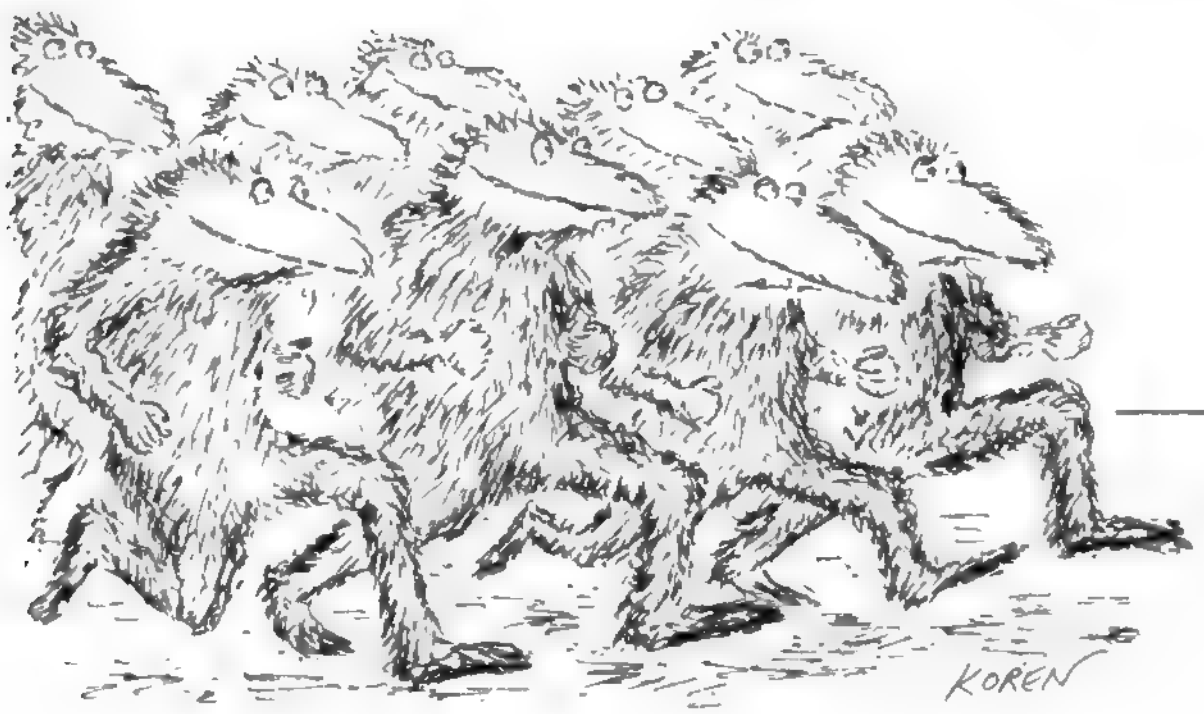
• **Curve Smoothing and Interpolation/Extrapolation.** Data-gathering researchers are often faced with a mass of numbers that apparently have no pattern, but must nevertheless show some pattern (otherwise, why was the experiment run?). A variety of methods have been devised to smooth the numbers into a nice curve on a graph. This routine uses one such method,

POWER-BASE™ WITH DATAZOOOM™

"Power-base™ is a menu-driven data management program with relational capabilities. It was the top-rated program overall, primarily because it was the easiest to learn and use, and rated highest in error handling."
The Ratings Book/Software Digest, March 1984

"To track the Bank of New England's IRA sales for all 16 branches, I chose Power-base™ because it responds so well to change while protecting the integrity of my database." *Bruce Montgomery, Bank of New England*

"This program is impressive—it's easy to use, simple, logical, and powerful and comes with flawless written documentation."
Giovanni Perrone, InfoWorld, March 12, 1984



the Lagrange polynomial, to draw a smooth line through all the data points. Once you have done this, you can then interpolate between data points with at least a little confidence. The program takes the data points, graphs the plot line, and displays both the original points and the plot line.

In addition to these programs, the book contains others that compute resonant electric circuits, solve queuing equations, test the reliability of systems such as office electronic equipment, and more. In each case, the author presents some background on the program, lists a sample run of the program output, and gives the code for the program itself. Lewart's programs are obviously well thought out and explained; he even explains the limitations of some of the routines. Also included in the documentation is an appendix of programming tips and an index, in which I found one omission.

Why Not the Best?

I have some reservations about this package—mainly about who would buy it, and why. Most of the programs are either elementary (such as the resonant electric circuit program—I can remember doing homework problems on this subject in freshman physics) or so advanced that the person who would use it probably has it already.

Moreover, I wonder about how the author and publisher selected these 19 programs to put in one book. It has nothing on economics, even though this topic is an essential component of much engineering work. The statistics packages—combinations, permutations and factorials, and binomial and hypergeometric distributions—strike me as rather mundane. Nor does it have any programs for such typical scientific analytical processes as linear algebra and matrix functions, regression analysis, vector analysis chi-squares, PERT project schedules, and so on. Most of the standard reference works for scientists and engineers that I know of cover these analyses.

I am aware, of course, that many other commercial software offerings remedy these omissions. Some of them cost a pretty penny, too, so I suppose I should be asking: What do you want for $29.95? On the other hand, if you are an electronics researcher who needs to graph complex numbers over a smooth curve for a geosynchronous satellite containing a resonant electrical circuit with artificial intelligence capabilities, this is the perfect book for you. ■

IS WAY AHEAD OF EVERYTHING.

"Because you don't have to wade through screens full of menus, the program is fast. Because your choices are always in front of you, the program is easy. Not much more you can ask for, is there?"
Bobbi Bullard, Computer Retailing, April 1984

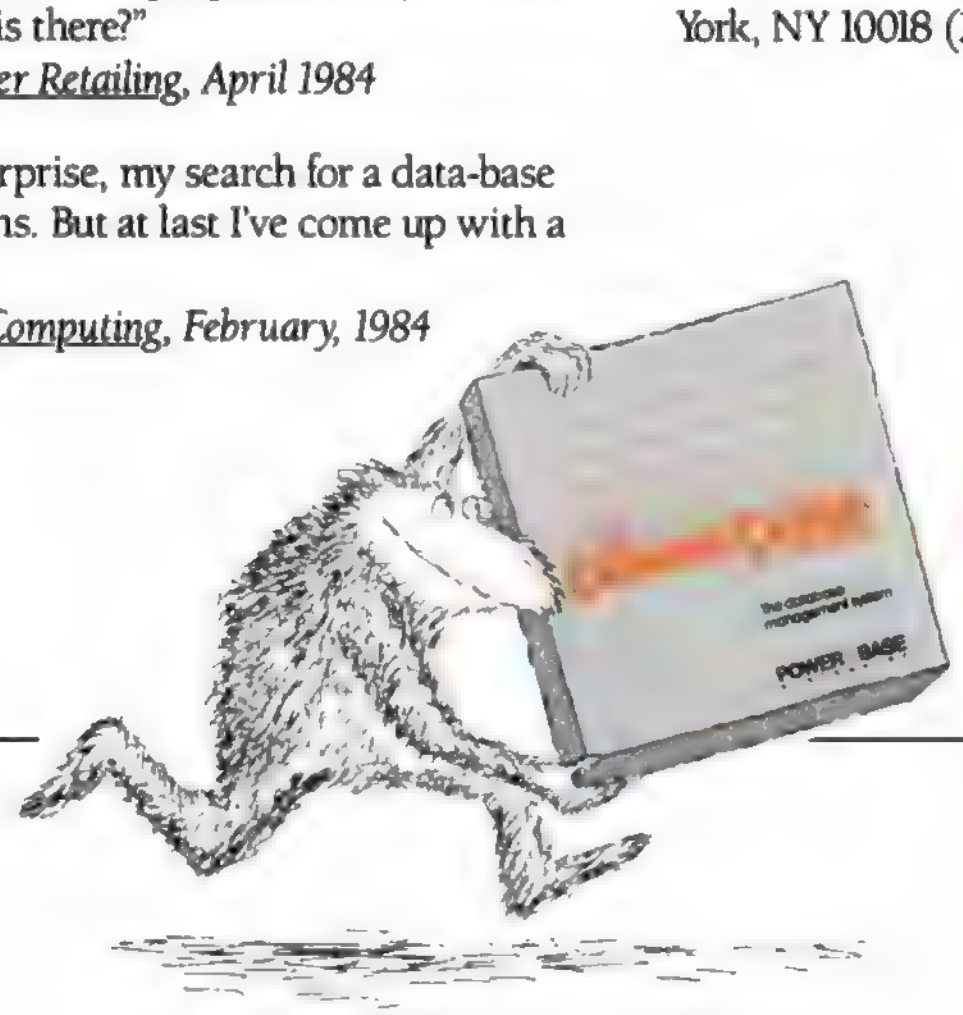
"Much to my surprise, my search for a data-base system took six months. But at last I've come up with a winner: Power-base."
Paul Bonner, Personal Computing, February, 1984

Visit your local computer dealer and experience Power-base™ for yourself.

PowerBase Systems, Inc., 12 West 37th Street, New York, NY 10018 (212) 947-3590

power-base with dataZOOM™

WE MADE IT POWERFUL.
BUT WE KEPT IT SIMPLE.



CIRCLE 160 ON READER SERVICE CARD

Power-base and DataZOOM are trademarks of PowerBase Systems, Inc.
For use on the IBM PC/XT or compatables.
IBM PC and IBM PC/XT are registered trademarks of the IBM Corporation

Modula-2. Simply Better.

More and more software developers are finding a new language simply better than C or Pascal. They're finding Modula-2, by Niklaus Wirth, the creator of Pascal. For professional programmers, it's simply a better language.

Modula-2. Simple like Pascal (if you know Pascal, you can be writing Modula programs in hours) but with much more power and flexibility. Power to handle any professional application, so there's no need for extensions.

Modula-2. Better than C because it gives you strong typing and superior separate compilation facilities. That means you write cleaner programs, faster.

Only LOGITECH's Modula-2/86 system translates directly into high-speed native code for PC-DOS™, MS-DOS™ and CP/M-86™.

No other system speeds your Modula programs along faster than our native code compiler. And our high-level, symbolic debugger ensures your programs arrive in flawless running condition.

Multi-level overlays, 8087 support, ROMable code, and a full library of standard modules make Modula-2/86 the perfect system for every professional application.

We also offer the only VAX/VMS™ resident and cross compiler for the 8086.

For VAX mainframes to PCs, look to LOGITECH's Modula-2 software development systems. For professional programmers, it's simply a better choice.

LOGITECH

805 Veterans Blvd., Redwood City, CA 94063
415•365•9852
LOGITECH SA (in Europe), CH•1143 Apples, Switzerland
LOGITECH Srl., Corso Nigra 60, 10015 IVREA TO, Italy

PC-DOS is a TM of IBM. MS-DOS is a TM of Microsoft. CP/M-86 is a TM of Digital Research. VAX VMS is a TM of Digital Equipment Corp

CIRCLE 202 ON READER SERVICE CARD

CALL TOLL FREE 1-800-528-1054

COMPUTER WAREHOUSE

PRINTERS

C. Itoh

8510 Parallel (Prowriter)	$319
8510 BPI	$389
F-10 Parallel	$915
55 CPS Parallel	$1199

Comrex

CR II Parallel	$439

Computers International

Datawriter 2000 w/48K	$985

Diablo

620 API	$739
630 API	$1699
630 ECS/IBM	$1995

Epson

All Printer Models	Call

Inforunner

Riteman	$249

Juki

6100	Call

NEC

2050	$789
3550	$1519

Okidata

All Printer Models	Call

Panasonic

1090	Call
1091	Call
1092	Call

PRINTERS

Qume

Letter Pro 20 Parallel	$629
11/40 W/IBM Interface	$1369
11/55 W/IBM Interface	$1569

Silver Reed

EXP400	Call
EXP500 Parallel	$385
EXP550 Parallel	$479
EXP770	Call

Star Micronics

All Printer Models	$289

Tally

Spirit 80	$289
160L W/Tractor	$559
180L W/Tractors	$779

Toshiba

P1340 Parallel	$749
P1350 Parallel	$1445
P1351 Parallel	$1459

Transtar

120 Parallel	$395
130 Parallel	$549

SPECIAL OF THE MONTH

HAYES

1200B Modem $420

QUADRAM

Quadlink	$449
Quadboard 256K (Expands to 384K)	$469
Quadboard II 256K (Expands to 384K)	$469

MONITORS

Amdek

310 Amber	$160

Princeton Graphic

HX-12	$469

DISKETTES

Elephant

5¼ DS/DD (Qty 100)	$218

Maxell

MD-2 (Qty 100)	$275

Scotch

5¼ DS/DD (Qty 100)	$245

COMPUTERS

Eagle

PC+2 W/Eagle Adaptor & Monitor	Call
Spirit 2	Call
Spirit XL	Call

Sanyo

MBC-550 W/Printer	$1199
MBC-555 W/Printer	$1499
MBC-550-2 W/Printer	$1399
MBC-555-2 W/Printer	$1799

Zenith

All Z-150 & Z-160 Models	Call

MODEMS

Hayes

Smartmodem 1200B	See Special above

COMPUTER WAREHOUSE

2222 E. Indian School Rd. • Phoenix, Arizona 85016
Order Line: 1-800-528-1054
Order Processing & Other Information: 602-954-6109

Store Hours: Mon-Fri 10-5:30 Saturday 9-1 Order Line Hours: Mon-Fri 10-5:30 Saturday 9-1

Prices reflect 3% to 5% cash discount. Product shipped in factory cartons with manufacturer's warranty. Please add $8.00 per order for UPS shipping. Prices & availability subject to change without notice. Send cashier's check or money order...all other checks will delay shipping two weeks.

CIRCLE 135 ON READER SERVICE CARD

Beyond Essentials

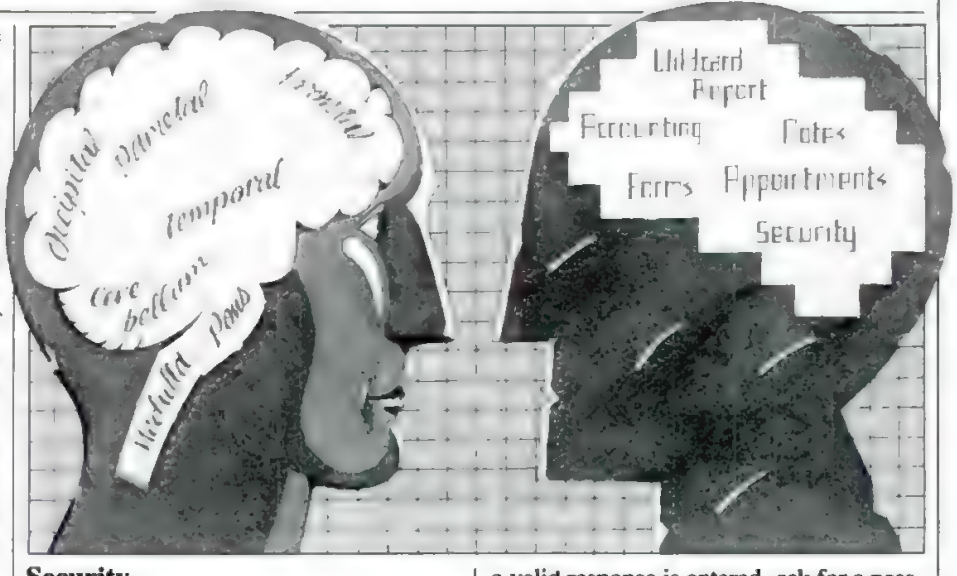
The complete medical management system isn't really complete without a few extra touches. You may not need all these extra features, but they make your work a little easier.

The essential components of the medical office management package are appropriate hardware and a sophisticated billing and accounting system. But few computer users are satisfied with the bare essentials. Most software developers are aware of this, and they often add enticing bells and whistles before they've even optimized the program's basic functions. These extras are of variable value, so reading up on their usefulness before you buy might save you from costly mistakes.

What follows is actually a wish list. Not all of the features mentioned are available on the PC yet, although they might be available on other computers. They should all be on the market soon, though.

Most programs can be customized to the extent of letting them know what printer you're using and how many drives your machine has. Some manufacturers, however, have designed software that you can truly tailor to your own needs. You can reassign the function keys or create keyboard macros that let you execute complex operations with a single keystroke.

More flexible programs let you add tax or interest to your patients' accounts or specify the wording of a gently threatening notice you want printed on your overdue bills. The ideal program would give you lots of room to be imaginative—while giving you guidance so that your imagination doesn't take you too far afield.



Security

Most programs allow you to specify a password without which the program won't start, but that may not be enough. Your patients ledgers and accounts receivable records are important and private. You probably don't want the temporary secretary who occasionally types office notes on your computer to be able to alter your financial records. Some of the more sophisticated packages will allow you to create a map of password hierarchies that will admit those who hold high-level codes into all parts of the system while restricting those with lower-level codes to less sensitive areas. These schemes can be quite involved. For example, a program might ask the user's name, and then, when a valid response is entered, ask for a password specific to that person.

Forms

You'll probably want to place billing information on several different forms to conform to Medicare, Medicaid, Blue Shield, and other third-party specifications. You may also want a separate form for patient billing and account summaries.

One method designers use to deal with the wide variety of formats users need is to let you decide for yourself how the printed paper should look, using a line and space map. Creative users can have a field day, while others can just copy the paper forms they've been using. Sample forms are sel-

Illustration: Phil Anderson

Corporate and Institutional Accounts Welcome



Disk Drives

MAYNARD HARD DISK

- **10 MEGABYTE** HARD DRIVE w/SANDSTAR MULTIFUNCTION CARD (WS1) $995
- **10 MEGABYTE** HARD DRIVE w/SANDSTAR FLOPPY DRIVE CONTROLLER CARD (WS2) $1159
- **10 MEGABYTE** HARD DRIVE s/SANDSTAR MEMORY CARD w/o MEM (WS3) $1159

Control Data Drives

- **CDC 9428** Half Height, Double Sided 40 TRK, 48 TPI $189
- **CDC 9409** 5¼" Double Sided 40 TRK, 48 TPI $219

Tandon Drives

- **TM 100-2** 5¼" Double Sided 40 TRK, 48 TPI $209

Shugart Drives

- **SA 455** Half Height, Double Sided 40 TRK, 48 TPI $189

Monitors

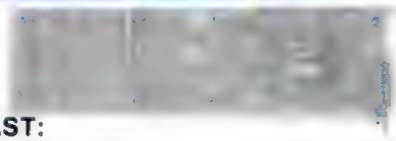
Princeton Monitors:

HX 12 RGB (690 X 240) ..... $Call
SR 12 RGB (690 X 480) ..... $Call
MAX 12 Amber Monochrome Monitor ..... $Call

Amdek:

310 A $175
300 A $169
300 G $159

Boards



AST:

Six Pak Plus W/64K, Clock Calendar, Parallel & Serial Ports (Options Available Game Port Upgradeable to 384K Bytes) $259

Memory 64K (Set of 9 Chips) $55

Mega Plus II W/64K, Clock Calendar, & Serial Port (Options Available: Parallel, Game, or Second Serial Port $269

I/O Plus II With Clock Calendar, & Serial Port. (Options Available: Parallel, Game, or Second Serial Port $115

Hercules:
Graphic Card W/Parallel Port $379

Koala:
Touch Table With Software $99

Maynard:
Disc Drive Controller $179

Paradise Systems:
Multidisplay Card (Both Color & Monochrome) $399

Persyst
Monochrome W/Parallel Port $239

Quadram:
Quad Color I $209
Quad Color II (Add On) $229

Sigma:
Disc Drive Controller $179

Printers

Epson:
RX 80 (100 CPS, PAR-10") ..... $Call
RX 80FT (100 CPS, PAR-10") ..... $Call
FX 80 (160 CPS , PAR-10") ..... $Call
RX 100 (100 CPS, PAR-15") ..... $Call
FX 100 (160 CPS, PAR-15") ..... $Call

Star-Micronics:
Gemini-10X (120 CPS, PAR-10") ..... $Call

Texas Instruments:
TI855 W/Tractor Feed $895

Okidata:
ML92 (160 CPS, PAR-10") $479
ML93 (160 CPS, PAR-15") $785
ML84P (200 CPS, PAR-15") $990

NEC:
3550 (33 CPS, PAR-16") $1789
2050 (20 CPS, PAR-16") $989

Mannesmann Tally:
Spirit 80 (80 CPS, PAR-10") $359
160L (160 CPS, SER & PAR-15" $629

Modems

Hayes 300 Baud $209
Hayes 1200 Baud $489
Hayes 1200 B Board $439
Novation Smartcat 103/212 ..... $429

How To Order: Order by calling CompuAdd toll free on 1-800-531-5475 (if outside of Texas) or 1-512-250-1489 (if in Texas). You can also order by mail. Orders may be charged to a MasterCard or Visa account at no extra charge, or paid by Cashier's Check or Money Order. We do accept personal checks. Allow 10 days for check processing. We pay shipping and handling on orders delivered in continental U.S.A. add 5% sales tax if Texas resident. All equipment carries a warranty.

CompuAdd Corp.

ORDER TOLL FREE:
(800) 531-5475 (If outside of Texas)
(512) 250-1489 (In Texas)

CIRCLE 228 ON READER SERVICE CARD

dom exactly what you need, but designing forms—enjoyable as it may sound—is a tedious process; you may be glad those canned forms are there.

Aside from billing forms, you may want your system to prepare a variety of other useful printed items. A hospital rounds sheet listing patients who are currently hospitalized and their location, diagnosis, and dates of admission and discharge can be valuable if you visit several different hospitals. An encounter form that contains the patient's name, the date, and a list of procedures that you can check off as you examine the patient can be useful for billing in the office. A recall notice generated by the machine and mailed a few days before the patient's appointment can reduce no-shows. Finally, you can have a bank deposit slip printed based on the transactions of the day.

Appointment Calendar

The value of an electronic appointment calendar is often debated. It's certainly useful if you'd like to print recall notices or daily office schedules, but the old-fashioned desk book is reliable and doesn't tie up a terminal. If you've got fewer than five schedules to follow, the desk book is faster than the computer, too.

But if you've got several offices scheduling you concurrently—or more than six schedules to keep straight—an electronic system that is immediately accessible to all your staff can be a great help.

Integration

A real wish-list item is a medical management system that would let you integrate the additional software of your choice. For instance, many medical systems claim the ability to keep clinical notes on-line, but often they allow only one page per patient. You can keep a medicine list here or your initial history and physical exam, but you'll have a hard time fitting much more into the limited space. If you keep copious notes, a good word processor would be useful to you. Though we all have our favorite word processors (mine are *WordStar*, *MultiMate*, and *Word Perfect*), you're stuck with the one provided by the medical management software.

You may occasionally find a medical program that includes general-ledger capabilities such as accounts payable, payroll maintenance, and check writing. But if the program you've chosen is weak in this area, you're stuck again. You can't buy a general accounting program and integrate it into your system.

What else can you ask for? Electronic billing, for one thing. If the third-party payors in your area have enough demand, they'll gear up to allow you to send your billing on disk or by phone to their computers. With this method there are fewer errors in typing, the cost of processing is lower, and the turnaround time is faster than conventional methods.

Access by telephone to a medical database is another useful extra. A wealth of information is available in the National Library of Medicine and other databases. If you or a covering physician has a portable computer, you might also like to have access to your patients' chart notes after hours by phone. Perhaps even more useful would be access to information related to your patients that is stored in the hospital's computer: lab data, chart notes, medicines used on the last admission, emergency room notes, and X-ray reports.

Having It All

If some of these extra features appeal to you, you'll probably be able to find them with careful shopping, especially if you can wait a while. But what if you like them all—can you have everything? Unfortunately, it's unlikely that any one medical management program will offer all the bells and whistles I've discussed. The ideal would be a flexible medical program that you could customize for your own needs and into which you could integrate your favorite word processing, general-ledger, and communications programs. From there, the rest is up to you. ■

FAST LETTER QUALITY FOR YOUR EPSON

Now you can print **letter quality** on your Epson FX printer at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. **Printer Boss**™ software gives you **two-pass dot-matrix letter quality** and lets you create a **printer buffer** of up to 32K. Or print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, at high speed, in a choice of five different type sizes.

Printer Boss™ also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 316 ON READER SERVICE CARD

In Software we're the *logical choice!*



LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg T.M. of Logicsoft, Inc

Continental U.S.

1-800-645-3491

300 Garden City Plaza,
Garden City, New York 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

VISA

NO SURCHARGE FOR CREDIT CARDS
Purchase orders accepted by qualified institutions
Add 2% for shipping and handling ☐COD ☐Check ☐Money Order ☐NYS residents add sales tax

MasterCard

TEAR and COMPARE

Use this card to Shop the magazines

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS

WORD PROCESSING

Multimate	$275
Microsoft Word with Mouse	$295
Wordperfect	$319
Wordstar Pro Pak	$365
WORDSTAR	$235
Peachtext 5000	$195
Wordplus-PC	$285
Volkswriter Deluxe	$175
Edix & Wordix	$255
Easywriter II, Speller, Mailer	$195
Finalword	$189
Think Tank	$159

SPREADSHEETS/GRAPHICS

Multiplan	$155
Supercalc³	$239
Framework	(lowest price!)
TK! Solver	$285
LOTUS 1-2-3	$309
Context MBA	$489
T/Maker III	$199
Open Access	$389
Jack 2	$359
Super Chartman II & IV	$349
BPS Graphics	$289
Fast Graphs	$185

DATA BASE/FINANCIAL

Quickcode	$169
Knowledgeman	$275
TIM IV	$269
R Base 4000 (Microrim)	$325
dBASE II	$375
Condor III	$359
Friday	$175
Data Base Manager II (Alpha)	$195
Infostar	$255
DataPath	(lowest price!)
Dow Jones	(lowest price!)
Financier II	$115

LANGUAGES/UTILITIES

Concurrent CP/M86 (Digital Research)	$205
Pascal MT+ (Digital Research)	$235
PL/1 (Digital Research)	$479
Display Manager (Digital Research)	$359
Lattice C Compiler (Lifeboat)	$325
CIS Cobol 86 (Digital Research)	$479
Pascal Compiler (Microsoft)	$245
C Compiler (Microsoft)	$325
Basic Compiler (Microsoft)	$245
Cobol Compiler (Microsoft)	$459
Business Basic (Microsoft)	$369
Fortran Compiler (Microsoft)	$245
Prokey 3.0	$95
Norton Utilities	$59
C Food Smorgasbord	$119

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

LOWEST PRICE GUARANTEE

WE'LL BEAT ANY PRICE BY $10 AND THANK YOU FOR THE PRIVILEGE

Tell us the advertiser and price for any IBM-PC software package advertised in a current issue of any popular computer publication and we'll beat that price by $10. This offer does not apply to those packages whose advertised price is under $100 or where LOGICSOFT's price is already the lowest!

WE OFFER OVER 400 OTHER TITLES

Prices subject to change without notice

TEAR AND SAVE

CLIP AND SAVE OUR CARD FOR YOUR FILE

VISA MasterCard

NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted by qualified institutions.

Add 2% for shipping and handling ☐COD ☐Check ☐Money Order

☐NYS residents add sales tax

1-800-645-3491

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

300 Garden City Plaza, Garden City, NY 11530

Continental U.S.
1-800-645-3491

New York State 516 741-0043
Canada 416 283 2354
Int'l Telex ... 230199 Swift UR LGS
Dom Telex 960127 Swift NYK LGS

Looking for an
Accounting System?

CALL US...
WE'VE EVALUATED OVER 50 OF THEM

See our ad in *Journal of Accountancy*

TOLL FREE CONSULT
TOLL FREE SUPPORT
LOWEST PRICE GUARANTEED

INFORMATION UNLIMITED SOFTWARE (IUS)

general ledger	$295
accounts payable	295
accounts receivable	295
payroll	375
inventory	295
order entry	295
financial series (G/L, A/P, A/R)	859

STATE OF THE ART

general ledger	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	399
sales invoicing	399
time keeping and billing	679

PEACHTREE SERIES 8

general ledger	$375
accounts payable	375
accounts receivable	375
payroll	375
inventory	375
sales invoicing	375
job costing	375

SOLOMON SERIES III

general ledger (client writeup)	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	479
order entry/invoicing	479
purchasing	479
job costing	799

GREAT PLAINS SOFTWARE

general ledger	$479
accounts payable	479
accounts receivable	479
payroll	479
inventory	479

MBSI (Realworld)

general ledger	$575
accounts payable	575
accounts receivable	575
payroll	575
order entry/inventory	575
sales analysis	289

OPEN SYSTEMS

general ledger	$559
accounts payable	559
accounts receivable	559
payroll	559
inventory	559
sales order processing	559
purchase order processing	559
job costing	559

THE BUSINESS LIBRARIES

general ledger	$459
accounts payable	459
accounts receivable	459
payroll	459
inventory control	549
sales order entry	549
purchase order tracking	549
profit planner	549
the librarian	149

TCS

client write up	$1060

A LOGICSOFT
EXCLUSIVE
CUSTOM THERMOGRAVED
(RAISED LETTERS)
CONTINUOUS STATIONERY

CHOICE OF STOCK DESIGNS OR WE CAN REPRODUCE YOUR LOGO OR ARTWORK
CALL FOR YOUR **FREE KIT** TODAY!

LOGICSOFT

We're known by the companies we keep

- ASHTON - TATE
- DIGITAL RESEARCH
- DOW JONES
- INNOVATIVE SOFTWARE
- IUS
- FOX and GELLER
- LIFETREE
- LOTUS
- MICRORIM
- MICROSOFT
- PEACHTREE
- SATELLITE SOFTWARE
- SOFTWARE ARTS
- SOFTWORD SYSTEMS
- SORCIM
- AND OVER 100 OTHER PUBLISHERS

- the Logical Choice!

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg T M of Logicsoft, Inc

NO SURCHARGE FOR CREDIT CARDS VISA MasterCard

Continental U.S.

1-800-645-3491

300 Garden City Plaza, Garden City, NY 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

NORTHEASTERN SOFTWARE

Look for us in every second issue

up to 50% OFF

Products for IBM

88 Ryders Ln, Stratford, CT 06497

Now larger facilities to serve you better:
School & corporate purchase orders accepted:
No additional charges for credit card orders:

Entertainment

	Our Price
ARMONK	
Executive Suite	28.00
ATARISOFT	
Defender	29.50
Centipede	29.50
Dig Dug	29.50
Donkey Kong	29.50
Joust	29.50
Jungle Hunt	29.50
Moon Patrol	29.50
Ms Pac Man	29.50
Pac Man	29.50
Pole Patrol	29.50
Robotron	29.50
Stargate	29.50
EPYX/AUTOMATED SIMULATIONS	
Crush Crumble & Chomp	31.00
Temple Of Apshai	28.00
Star Warrior	21.00
BLUECHIP	
Baron	42.00
Millionaire	42.00
Tycoon	42.00
BRODERBUND SOFTWARE	
Lode Runner	24.50
Serpentine	24.50
FUNTASTIC	
Big Top	28.00
Cosmic Crusaders	28.00
Master Miner	28.00
HAYDEN	
Sargon III	30.00
INFOCOM	
Deadline	35.00
Enchanter	35.00
Infidel	35.00
Planetfall	35.00
Sorcerer	35.00
Starcross	28.00
Suspended	35.00
Witness	35.00
Zork I	28.00
Zork II	28.00
Zork III	28.00
INNOVATIVE DESIGN SOFTWARE	
Pool	25.00
MICRO LAB	
Crisis Mountain	24.50
Death in the Caribbean	24.50
Dino Eggs	28.00
MICROSOFT	
Flight Simulator	36.00
ODESTA	
Backgammon	36.00
ORIGIN SYSTEMS	
Caverns of Callisto	24.50
Ultima III	42.00
ORION SOFTWARE	
J-Bird	26.00
PC-Man	24.50
Paratrooper	21.00
Pits & Stones	26.00
PC SOFTWARE	
Armchair Quarterback	24.50
Championship Blackjack	24.50
Chess 2001	24.50
SCREENPLAY	
Professional Blackjack	49.00
Asylum	19.25
SEGA CONSUMER PRODUCTS	
Buck Rogers	31.50
Congo Bongo	31.50
Startrek	31.50
Zaxxon	31.50
SILICA	
Frogger	24.50
Mr Cool	21.00
Golf Challenge	14.50
Cross Fire	21.00
SIRIUS SOFTWARE	
Buzzard Bait	24.50
Call To Arms	21.00
Gorgon II	27.00
SIR-TECH SOFTWARE	
Wizardry -1	41.00
STRATEGIC SIMULATIONS	
Battle for Normandy	31.00
The Warp Factor	31.00
Tigers In The Snow	31.00
SUBLOGIC	
Night Mission Pinball	30.00

Education

	Our Price
ADVANCED IDEAS	
Dinosaurs	28.00
Wizard Of Words	28.00
Lucky's Magic Hat	28.00
BARRON'S EDUCATIONAL SERIES	
Computer SAT	56.00
CBS SOFTWARE	
College Board	118.00
Goren's Bridge	56.00
Mastering The SAT	101.00
Murder By The Dozen	24.50
Match Wits	21.00
CDEX	
Advanced Lotus 1-2-3	49.00
Data Base II Training	49.00
Easy Writer Training	49.00
How To Use The IBM PC	49.00
How To Use The IBM PC W/CPM	49.00
COMPREHENSIVE	
PC Pal	28.00
PC Tutor	42.00
COUNTERPOINT SOFTWARE	
Early Games For Young Children	21.00
Early Games Fraction Factory	21.00
Early Games match Maker	21.00
Early Games Piece of Cake	21.00
Quizagon	28.00
DAVIDSON & ASSOCIATES	
Mathbuster	35.00
Speed Reader II	49.00
Word Attack	35.00
DESIGNWARE	
Creature Creator	28.00
Crypto Cube	28.00
Math Maze	28.00
Spellicopter	28.00
Spellakazam	28.00
Spellagraph	28.00
Tra-a-zord	28.00
DLM	
Alien Addibon	24.00
Minus Mission	24.00
Meteor Multiplicabon	24.00
Demolibon Division	24.00
Alligator Mix	24.00
Dragon Mix	24.00
EDUWARE	
Algebra I	28.00
HARCOURT BRACE JOVANOVICH	
Computer SAT	56.00
Gre Test	63.00
HUMAN EDGE	
Management Edge	165.00
Sales Edge	165.00
Negotiation Edge	165.00
MET COMP	
Speed Read Plus	62.00
KNOWARE	
Knoware	67.00
LEARNING CO.	
Magic Spells	24.50
Moptown Hotel	28.00
Moptown Parade	28.00
Work Spinner	24.50
Addition Magician	24.50
MECA	
Basic Building Blocks	56.00
SCARBOROUGH	
Master Type	35.00
Song Writer	28.00
SCHOLASTIC	
Turtle Tracks	28.00
SIERRA ON-LINE	
Dragon s Keep	21.00
Troll's Tale	21.00
SIMON & SCHUSTER	
Typing Tutor II	35.00
Wordivision	56.00
SPINNAKER SOFTWARE	
Alphabet Zoo	21.00
Delta Drawing	35.00
Face Maker	24.50
Fraction Fever	24.50
Hey Diddle Diddle	21.00
In Search Of The Most Amazing Thing	28.00
Kindercomp	21.00
Rhymes & Riddles	21.00
UNICORN SOFTWARE COMPANY	
Ships Ahoy	28.00

Business

	Our Price
ALPHA	
Database Manager II	199.00
Apple IBM Connection	165.00
APPLIED SOFTWARE TECHNOLOGY	
Versaform	255.00
ASHTON TATE	
Friday	190.00
d Base II	320.00
d Base III	Call
ASK MICRO	
AP/AR/GL	99. 356.00
Inventory	270.00
Payroll	270.00
BPI	
General Accounting	385.00
Job Costing	385.00
BEST PROGRAMS	
PC/Personal Finance Program	74.00
PC/Tax Cut	183.00
BIBLE	
The Word	129.50
CHANG LABS	
File Plan	191.00
Graph Plan	191.00
Memo Plan	191.00
Starter Kit (Memo/Graph/File)	499.00
CONTINENTAL SOFTWARE	
Home Accountant Plus	199.00
Property Management	320.00
FCM	84.00
The Tax Advantage	49.00
DIGITAL RESEARCH	
CPM/86	82.00
Dr Logo	57.50
C Compiler	255.00
DOW JONES	
Market Analyzer	225.00
Market Manager	193.00
EINSTEIN	
Writer	195.00
Speller	101.00
Mailer	56.00
FINANCIER INC.	
Financier II	118.00
Tax Series	98.00
FOX & GELLER	
D Ublity	67.00
Quickcode	181.00
FUNK SOFTWARE	
Sideways	42.00
HAYDEN	
Pie Writer	129.00
The Writer	33.00
The Speller	35.00
The Writing Tool Kit	56.00
The Planner	70.00
The Calendar	35.00
HOWARD SOFT	
Real Estate Analyzer II	180.00
INFORMATION UNLIMITED	
Easy Speller II	67.50
Easy Mailer II	67.50
Easy Writer II System	256.00
Easy Filer	256.00
Easy Planner	162.00
LIFEBOAT SYSTEMS	
Lattice C Compiler	325.00
LIFETREE SOFTWARE	
Volkswriter	126.00
Volkswriter Deluxe	185.00
LINK SYSTEMS	
Datafax	184.00
LIVING VIDEOTEXT	
Think Tank	126.00
LOTUS DEVELOPMENT	
1-2-3	Call
MAIN STREET SOFTWARE	
Main Street Filer	191.00
MECA	
Managing Your Money	130.00
MICROPRO	
Mail Merge	162.00
Spell Star	101.00
Word Star Professional, 4 Pak	450.00
Star Index	126.00
Info Star +	385.00
Report Star	225.00
MICRORIM	
R base 4000	320.00
Clout	124.00

Business contd.

	Our Price
Extended Report Writer	99.00
MICROSOFT	
Multiplan	126.00
Word	245.00
Word With Mouse	307.00
Financial Statement	67.50
Budget	101.00
MONOGRAM	
Dollars & Sense	110.00
MICROSTUF	
Crosstalk XVI	126.00
PBL	
Personal Investor	126.00
PEACHTREE	
Peach Pak (G/L,A/R,A/P)	235.00
Peach Text 5000	235.00
PEARLSOFT	
Personal Pearl	191.00
Accounting Pearl	580.00
PROFESSIONAL SOFTWARE	
Word Plus	255.00
Word Plus Jr	101.00
Word Plus With The Boss	320.00
SATALITE SOFTWARE	
Word Perfect	265.00
SOFTWARE PUBLISHING	
PFS Report	84.00
PFS Write	84.00
PFS Graph	84.00
PFS File	84.00
SORCIM	
Super Calc II	181.00
Super Calc III	256.00
Superwriter	181.00
SUNDEX	
CPA	110.00
VISI CORP	
Visi Calc IV	160.00
Visi File	210.00
Visi Schedule	210.00
Visi Word Plus	253.00
Visi Trend/Plot	210.00

Printers

BROTHER	
HR-25	775.00
C ITOH	
Prowriter 8510P	353.00
Prowriter 8510SP	485.00
Prowriter 8510SPC	569.00
Starwriter F-10 (40CPS)	997.00
Starwriter F-10 (55CPS)	1,373.00
DYNAX	
DX-15	485.00
EPSON	
FX 80	550.00
FX 100	700.00
RX 80 FT	400.00
IDS	
Prism 80 (Basic)	1,050.00
Prism 80 (Full)	1,385.00
Prism 132 (Basic)	1,225.00
Prism 132 (Full)	1,655.00
Microprism	425.00
JUKI	
6100	450.00
MANASMAN TALLY	
MT 160L	599.00
MT 180L	820.00
MT 160 2P	1,325.00
NEC	
NEC 2050	1,440.00
OKIDATA	
92 P	470.00
93 P	700.00
QUME	
Printers	Call
SILVER REED	
Exp 550 P	585.00
Exp 500 P	431.00
Exp 550 S	560.00
Exp 500 S	460.00
STAR MICRONICS	
Gemini 10X	299.00
Gemini 15X	409.00
Power Type	359.00
Radix-10	675.00
Radix-15	775.00
TRANSTAR	
315	470.00

Specials

CENTRAL POINT	
Copy PC	25.00
PETER NORTON	
Norton Utilities	55.00

Monitors

	Our Price
AMDEK	
310A	175.00
300A	160.00
300G	149.00
Color II Plus	440.00
Color III Plus	379.00
PGS	
HX-12	485.00
Max 12	196.00
QUADRAM	
Quadchrome	520.00
TAXAN	
RGB III	444.00
RGB 420	535.00
USI	
12" Green	125.00
12" Amber	142.00

Modems

ANCHOR AUTOMATION	
Mark XII Modem	285.00
Mark VI PC Modem	200.00
HAYES	
Smartmodem 1200B (IBM-PC)	439.00
Stack Chronograph (RS-232)	199.00
Stack Smartmdm 1200 (RS-232)	225.00
Smartmodem 1200 (RA-232)	535.00
Micromodem 100	275.00
NOVATION	
Access 1-2-3	473.00
Smart Cat 103-212	415.00
212 Auto Cat	579.00
J-Cat	164.00
Cat	139.00

Accessories

KOALA	
Koala Pad	109.00
CHALKBOARD	
Power Pad	89.00
Starter Kit	39.00
Leonardo Logo	39.00
Leos Links	27.00
Bear Jam	25.00
Programers Kit	19.00
KENSINGTON	
PC Saver	49.00
Micro Saver	59.00
KEYTRONIC	
Keyboard 5150	199.00
TITAN	
Accelerator PC	750.00
MICROSOFT	
Ram Card 256K	385.00
System Card 64K	295.00
System Card 256K	459.00
Mouse	145.00
TG	
Joystick	40.00
PLANTRONICS	
Color Plus	375.00
AST	
Combo Plus 256K (S/P/C)	495.00
Mega Plus 256K (2S/P/C)	595.00
Six Pack Plus 256K (S/P/C&SW)	495.00
QUADRAM	
Quaklink	485.00
Quad Board II	230.00
Quad Board + 256K	515.00
Expanded Quad Board OK	225.00
Expanded Quad Board 384K	599.00
Quad Color II Upgrade	230.00
Quad Color I	225.00
Quad Chrome Color Monitor	540.00
Quad 512 Plus	751.00
Microfazer P to P	145.00
Microfazer S to S	155.00
STB SYSTEMS	
Graphix Plus	285.00
Monochrome Card	237.00
Rio-Plus 064K	595.00
Printer Plus	99.00
PERSYST	
Color Graphics Board	235.00
Monochrome Board	245.00
TANDON	
10 MB Hard Disk	1,500.00
HERCULES COMPUTER	
Graphics Card	300.00
HAYES PRODUCTS	Call

If something you would like is not listed, just call. If we don't have it, we can get it.

VISA

MasterCard

For Fast Delivery send cashier's check, certified check or money order Personal and company check allow 3 weeks to clear Shipping - Software ($2 50 minimum) C O D add an additional $1 75 Shipping - Hardware (please call) Alaska, Hawaii, Canada, PO, APO and FPO $5 00 minimum Foreign orders - $15 00 minimum and 15% of all orders over $100 Mastercard & Visa (include card # and expiration date) Connecticut residents add 7 5% sales tax We ship same day for most orders Prices subject to change without notice School purchase orders accepted All returns must have a return authorization number Call 203-268-1850 to obtain one before returning goods for replacement

ORDERS ONLY - TOLL FREE
7 DAYS/WK 9AM to 11PM EST
1-800-382-2242

For Inquiries and Connecticut Orders Call (203) 268-1850 CIRCLE 120 ON READER SERVICE CARD

Get your Epson's worth with Set-FX+



SoftStyle™

SoftStyle, Inc. • Suite 205, Dept. C • 7192 Kalanianaole Hwy.
Honolulu, Hawaii 96825 • (808) 396-6368

Set-FX+ adds big pluses to the versatility of *all* Epson printers.

- ☐ Simple-to-set print modes, including condensed, emphasized, italics and many more.
- ☐ Print those missing IBM characters, including line graphics, math and science symbols.
- ☐ Create special characters or even design custom fonts.
- ☐ Pivot Printing™ to rotate text 90° for super wide spreadsheets.

Convenient access to your printer's full capabilities, *plus* even more.

There are no difficult codes to remember or program. Set-FX+ menus put printer power at your fingertips!

Set-FX+ software comes with a clear, complete instruction manual, and quick reference guide. Set-FX+ even includes an Ideas program and special fonts to get you started. Special fonts include IBM, Old English, Greek symbols, *plus* others.

No Epson can afford to be without Set-FX+. Only **$59.95.**

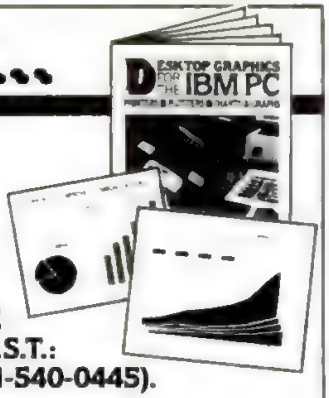
To get *your* Epson's worth, ask your dealer for SoftStyle's Set-FX+ or order direct.

Toll-free orders: 1-800-367-5600

For the IBM PC, PC-XT, PCjr, Compaq and IBM compatibles running DOS. Compatible with the Epson MX, RX, FX and LQ printers as well as IBM graphics printers (MX needs Graftrax III) Set-FX+ prints in full speed text mode on the FX printer. MC/VISA accepted. Add $2 shipping/handling, U.S. and Canada ($10 for others).

CIRCLE 253 ON READER SERVICE CARD

USING?...BUYING?...UPGRADING?...



A GRAPHICS PACKAGE FOR YOUR PC

You have to create graphs and charts to tell a story. Your needs vary from financial statements and personnel benefits to inventory records. Presentations are made on slides, printouts and monitors. You need a good and easy-to-manage graphics package. You need DESKTOP GRAPHICS FOR THE IBM PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS, the fully illustrated guide to the preparation, design and production of business graphics.

This book is written with you in mind—the business or professional user with little technical or statistical knowledge, using or planning to purchase a graphics package. You'll find out what charts are available to you...what data works best with each chart...what hardware options you have... and a comparison of the four leading software packages that will best meet your needs.

Author Corey Sandler gives you clear and non-technical introductions to graphics theory and statistics, making this seemingly impossible task, easy.

If you've been contemplating buying a new graphics package or you just want to do more with your current package, this book is for you!

For faster service, PHONE TOLL FREE: 9 am-5 pm E.S.T.: 1-800-631-8112 (In NJ 201-540-0445).

Also available at your local bookstore or computer store.

CREATIVE COMPUTING PRESS
Department NL9H. 39 East Hanover Avenue. Morris Plains, NJ 07950

Please send me _____ copies of DESKTOP GRAPHICS FOR THE IBM PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS at $14.95* plus $2.00 postage and handling ($5.00 outside USA) each. Item #60-7.

Payment Enclosed $_____.* Residents of CA, NJ and NY State add applicable sales tax.

Charge My: ☐ AmEx ☐ MC ☐ Visa

Card No._____ Exp. Date_____

Mr./Mrs./Ms._____
print full name

Address_____

City/State/Zip_____

☐ Please send free catalog.

New On The Market

HARDWARE

Cygnet CoSystem

A voice and data communications system designed to operate independently or in conjunction with the user's system. Incorporating a microprocessor, the CoSystem can handle simultaneous voice and data teleconferencing over normal phone lines, with smart modem features such as autodialing/redialing. Other features of the device include programmable function keys, automation of special PBX calling functions, automatic database/electronic mail system accessing, terminal emulation, and the ability to record details of all communications activities.

Versions of the Cygnet CoSystem unit are available for 300- or 1200-baud communications. An add-on speakerphone option is also available.

(List Price: 300-baud $1495; 1200-baud $1,845)
Cygnet Technologies, Inc.
1296 Lawrence Sta. Rd.
Sunnyvale, CA 94089
(408) 734-9946

CIRCLE 782 ON READER SERVICE CARD



***Cygnet CoSystem**, Cygnet Technologies, Inc.*

Microfloppy Disk Drives

Two 3.25-inch disk drives using a standard 5.25 interface, offering storage capacities of 500 kilobytes or 1 megabyte per diskette. The MPI Model 321 (single-sided, 500 kilobyte capacity), and the MPI Model 322 (double-sided, 1 megabyte capacity) drives use flexible-jacket microdiskettes, with fewer moving parts than the semi-rigid 3.25 disks. The drives feature a track-to-track access time of 6 milliseconds, with 140 tracks per double-sided disk.

The MPI microdiskette drives are plug-compatible with standard double-sided IBM PC 5.25-inch drives. The media's format—80 tracks per side—allows the user to download double-sided 5.25-inch software to the microfloppy drives' diskettes without modifications.

(List Price: Model 321 $189; Model 322 $290)
MPI
9754 Deering Ave.
Chatsworth, CA 91311
(213) 709-4202

CIRCLE 781 ON READER SERVICE CARD

Intelligent Data Collector

A remote data collection device designed to store and transmit data to a PC over serial communication lines. The device can collect and edit data from punched badge cards and either transmit the data immediately to the host computer or store it in memory for later polling by a *Data Retrieval Program* also available from the manufacturer.

(List Price: Data Collector $2,995; Data Retrieval Program $25; set of 50 punched badges $97.50)
Requires: *Data Retrieval Program:* 128K RAM, one disk drive, PC-DOS, serial communication port.
Tech-S, Inc.
12997 Merriman Rd.
Livonia, MI 48150
(313) 425-9800

CIRCLE 790 ON READER SERVICE CARD

DataTalker II

An intelligent front-end processor that can emulate a range of remote batch and interactive IBM mainframe terminals under software control. The included software allows the user's system to emulate the IBM 3271 and 3275/76 interac-

tive terminals, and the 3780, 2780, 3741, 2968, and 2770 remote batch terminals in attended or unattended mode, using full IBM bisync protocol emulation. The device can operate under PC-DOS, CP/M-86, and Concurrent CP/M-86 operating systems.

The communications processor incorporates a Z-80A microprocessor, 64K RAM, shared memory buffering, dual ported memory, and two serial channels capable of synchronous or asynchronous communications through either port. Communication is at data rates of 1200 to 19,200 baud over Bell protocols 212, 201A, 201C, 208B, 209A, and other compatible modem protocols.

The DataTalker II connects to the RS-232 serial port of the user's system and includes software with an on-line trace facility for isolating line problems. The trace displays received data link control characters, transmitted messages, and command status transactions. A separate, off-line diagnostic program verifies the operation of the unit's real-time clock and serial port when the device is connected to a modem. All relevant modem handshaking lines are tested.
(List Price: $995)
Winterhalter, Inc.
3853 Research Park Dr.
Ann Arbor, MI 48104
(313) 682-8834

CIRCLE 783 ON READER SERVICE CARD



***DataTalker II**, Winterhalter, Inc.*

SOFTWARE

file search 3

A text file-management program employing simple file headers, unstructured key word entry/retrievals, and file searches with vague or incomplete data. With *file search 3*, the user can assign each file a header containing pertinent data and key words that identify the contents of the file. A "fill-in-the-blanks" screen handler guides the user in the entry of header information, including up to 150 key search words per text file or document.

Files can be retrieved by author, addressee, date, or one or more key words. Conditional expressions (AND, OR, and NOT) and multistage retrieval can be used to extend or limit searches, even with queries that are general or vague.
(List Price: $395)
Requires: 128K RAM, one disk drive, PC-DOS 2.0.
Data Technology Corp.
2775 Northwestern Pkwy.
Santa Clara, CA 95051
(408) 496-0434
TWX: 910-338-2044

CIRCLE 756 ON READER SERVICE CARD



***file search 3**, Data Technology Corp.*

Mail Order Pro

A mail order processing program that can process up to 500 orders per day. It produces mailing labels, VISA/MC/AMEX sales drafts, packing lists, back-order notices, and C.O.D. tags, while tracking current inventory and back orders.
(List Price: $695)
Requires: 128K RAM, two disk drives, PC-DOS 1.1, 132-col. printer.
Professional Publications
P.O. Box 199
San Carlos, CA 94070
(415) 593-9119

CIRCLE 766 ON READER SERVICE CARD

STRATA:G

A financial strategic planning program for retail executives. The software feeds departmental and combined open-to-buy data into a 12-month plan format consisting of cash flow, profit and loss, and balance sheet projections. In addition, it provides for retail management of gross margins, cash flows, banking requirements, working capital, critical ratios, balance, inventory planning, and trend analyses.

(List Price: $750)

Requires: 128K RAM, one disk drive, PC-DOS.

Retail Management Aids, Inc.
Skinner Bldg., #618-620
Seattle, WA 98101
(206) 623-3973

CIRCLE 763 ON READER SERVICE CARD

PLOT88

A FORTRAN graphics routine library, permitting the user to produce line graphics such as charts, graphs, and contour maps up to a size of 50 square feet. *PLOT88* provides pen plotter emulation on the IBM display screen, IBM or Epson printer, and the Tektronics 4025 terminal.

Included in the library of functions are AXIS, FACTOR, LINE, NEWPEN, NUMBER, PLOT, PLOTS, SCALE, SYMBOL, and WHERE routines.

PLOT88 allows the user to produce a drawing in its entirety or to divide it into sections. The software also includes the capability of mixing text in varying sizes and at any angle with the line graphics.

(List Price: $250)

Requires: 128K RAM, one disk drive, PC-DOS, MS-FORTRAN Compiler Ver. 3.1, graphics output device.

PLOTWORKS
P.O. Box 12385
La Jolla, CA 92037
(619) 457-5090

CIRCLE 784 ON READER SERVICE CARD

Jury Trial II

A courtroom strategy game. *Jury Trial II* features a cast of characters supported by individual dossiers in the accompanying documentation. Among the personalities introduced in this version are Mr. Wallbanger, the town drunk, and the voluptuous Linda LaVerne, a flirtatious nightclub dancer.

Players take on the dual role of prosecutor and defense attorney and attempt to "stack the jury" by choosing biased candidates. The outcome of the trial depends on the skillful tactics of the competing attorneys.

Case evidence is developed by interviewing the venerable county sheriff, who is uncooperative, impatient, and generally onerous to deal with. The computer acts as the judge, controlling the proceedings, ruling on objections, admitting evidence, and occasionally citing a witness for contempt of court.

After the case is tried and the jury decides on a verdict, the "judge" passes sentence. Appeals to a higher court are possible, but bail must be posted. A new case is assigned for every game.

(List Price: $49)

Requires: 64K RAM, one disk drive, PC-DOS.

Navic Software
Palm Beach, FL 33408
(305) 627-4132

CIRCLE 753 ON READER SERVICE CARD

ArabStar2

A multilingual word processing program utilizing several different foreign character sets, including the Arabic, Farsi, Urdu, and Malay alphabets. *ArabStar2* has integrated printing functions, including text transcriptions, block manipulations, and composition.

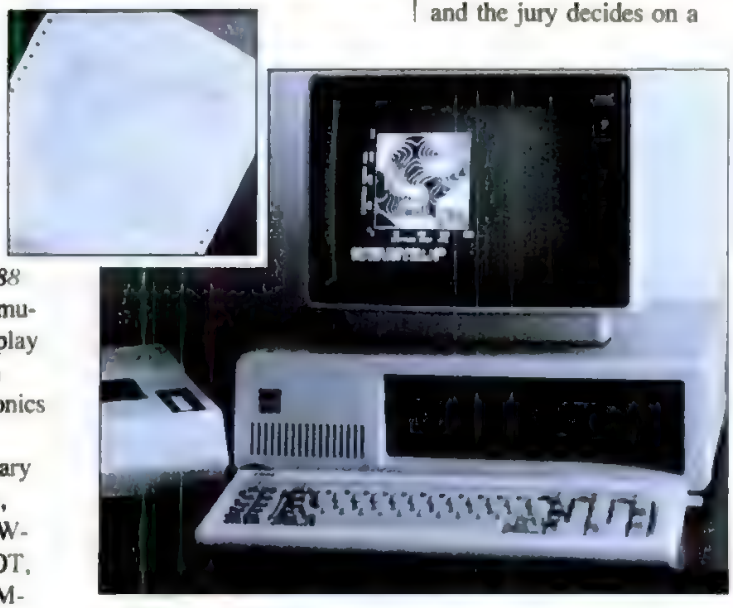
The word processing software can form text into a double-column format, with independent editing of each column. Maximum line widths of 132 characters are possible, with the screen acting as a window. All *ArabStar2* features are driven by menus.

(List Price: $900)

Requires: 128K RAM, one disk drive, PC-DOS.

Appropriate Technology Ltd.
c/o Summit CAD Corp.
5222 FM 1960 W 100
Houston, TX 77069
(713) 440-1468

CIRCLE 785 ON READER SERVICE CARD



PLOT88, PLOTWORKS



In-Search, Menlo Corp.

In-Search

A program providing access to, and rapid searching of, over 200 on-line databases maintained by Dialog Information Services Inc. *In-Search* connects to these databases through the user's modem; once connected, the software guides the user through data searches with on-screen graphics, extensive help commands, and built-in database descriptions.

Many search functions can be completed off line prior to connecting to the database, reducing connect time charges. Search strategies can be set up and the appropriate database chosen before actually making the call to Dialog. *In-Search* also eliminates the often time consuming task of manually entering the database's phone number, codes, and required passwords. Once the search strategy has been formulated, a single keystroke can automatically connect onto Dialog and start the search.
(List Price: $399)
Requires: 192K RAM, two 320K disk drives, PC-DOS.
Menlo Corp.
4633 Old Ironsides Dr.
#400
Santa Clara, CA 95050
(408) 986-0200

CIRCLE 792 ON READER SERVICE CARD

Docuwriter jr

A full-screen word processing program designed for the IBM-PC*jr*. The disk file output is directly compatible with other ASCII word processors, such as *WordStar*, permitting files created on the PC*jr* to be transferred to other systems for futher processing.

Docuwriter jr allows the creation of documents up to 130 columns wide using on-screen horizontal scrolling. All PC*jr* edit keys are supported for text insertion, deletion, and cursor control. Also provided are block moves, delete, and copy functions, and user-controlled search-and-replace. The system also includes word wrap and full text justification.
(List Price: $79.95)
Requires: PC*jr*: 128K RAM, one disk drive, PC-DOS 2.1.
CMA Micro Computer
55722 Santa Fe Trail
Yucca Valley, CA 92284
(619) 365-9718

CIRCLE 760 ON READER SERVICE CARD

VALUE/SCREEN

An investment analysis program, capable of sorting through thousands of stocks for those that meet up to nine user-selected criteria for investment. The program offers an array of 32 investment variables from which to choose those that meet the user's objectives. Variables offered include critical statistics, projections, and performance rankings.

VALUE/SCREEN is bundled with Value Line data disks, which list pertinent information for 1,650 stocks on a single diskette. Monthly updates for one year of the Value Line data disks are provided to users of *VALUE/SCREEN* as part of the software package.
(List Price: $495)
Requires: 64K RAM, one 320K drive, PC-DOS.
Value Line, Inc.
711 Third Ave.
New York, NY 10017
(212) 687-3965

CIRCLE 750 ON READER SERVICE CARD

Time Accountant

A time accounting/billing program permitting billing cycles and accounting periods of any length. Client, project, activity, and individual codes can consist of up to ten alphanumeric characters, as well as several punctuation characters.

The software includes a set of specially formatted calendar booklets in which the users enter appointments, activities, out-of-pocket expenses, and buy-outs. These data are transferred regularly to time sheets, from which the data, along with related codes, are stored in *Time Accountant* files. The software then performs all necessary calculations, generates needed reports, and bills active clients.

Time Accountant's capacity is limited only by the storage capacity of the user's system. Data entry fields are designed to screen out unacceptable entries. On-line help screens are available to assist operators, and the system displays cautionary messages concerning postings and other critical operations.

(List Price: $495)

Requires: 128K RAM, two 320K drives, PC DOS.

Software Quality Associates
636 Waverley St.
Palo Alto, CA 94301
(415) 327-3511

CIRCLE 787 ON READER SERVICE CARD



***Time Accountant**, Software Quality Associates*

Sorting System I

A tutorial program designed to demonstrate and teach the algorithms most commonly used for sorting, using color or monochrome graphics. The included sort routines may be run with a user's own programs and data. BASIC source code and description of the algorithms used is included with the accompanying manual.

(List Price: $45)

Requires: 64K, one disk drive, PC-DOS.

General Computing
145 Summit Dr.
Cedar Falls, IA 50613
(319) 277-7105

CIRCLE 762 ON READER SERVICE CARD

TTM II Market Analysis System

A technical analysis program for investment data. The user enters the daily closing prices of a stock index. Weekly, the number of new lows that have been reached on the New York Stock Exchange are also entered. From this data, *TTM II* produces daily intermediate term signals, recommendations to the user to either buy, sell, or do nothing with the stocks listed in the daily index. The accompanying manual describes how a variety of trading vehicles can be used to follow these daily signals.

In addition to examining, analyzing, and correcting old stock data, the software can also display graphs of its database, and can print out its own track record. Advanced users can change the parameters controlling buy and sell decisions to customize the system to different stock markets or even commodities markets.

The *TTM II* software includes New York Stock Exchange data going back to 1971.

(List Price: $499; manual alone $49)

Requires: 128K RAM, one disk drive, PC-DOS.

Sabtek Corp.
Dept. PCN
P.O. Box 1952
Cambridge, MA 02238

CIRCLE 794 ON READER SERVICE CARD

Cribbage

A game program that teaches the rules of Cribbage, scoring, and play strategies. Also included in the software is the history of the game.

Cribbage offers multiple player skill levels, and can run on either monochrome or color monitors.

(List Price: $29)

Requires: 96K RAM, one disk drive, PC-DOS.

Tailored Data, Inc.
4940 Viking Dr.
Minneapolis, MN 55435
(612) 831-3460

CIRCLE 765 ON READER SERVICE CARD


The Bettmann Archive

All he could do was hit.

And the Babe's fans loved him for it. Doing one thing very well has its rewards. Some people make history. Some set records. Some win hearts.

Multimate International. In a brief 18 months, a growing "fan club" of users has made us one of the leading software companies in the world. The object of their affection: Multimate, the program that put the power and speed of a Wang dedicated word processor into the IBM PC.

We've carved a niche in office automation. By committing ourselves to word processing. And to matching the IBM PC line, product for product. But we're also committed to extending the reach of word processing. By broadening our Multimate line to include data management, and, in the near future, a program that will allow users to convert Wang files to the Multimate format.

Multimate International. We've come a long way in a short time by being very good at what we do. We intend to keep it that way.

To find out more about Multimate, the word processor, and Multimate International, the company, call Jordan Caswell at 1-800-243-3142.

Multimate

We're putting our reputation into words.

Terminal Emulator Software

Two terminal emulator programs for using the IBM PC as remote entry stations with IBM mainframe systems. The *SDI3780* program offers the features and functions of the IBM 3780 Remote Job Entry Workstation, with the exception of Home Mode and On-Line Test Mode. The reader, printer, and punch functions are simulated via the PC's disk drives and supported printers.

The *SDI2780* program emulates every feature of the IBM 2780 Workstation with the exception of the Six-Bit Transcode, Synchronous Clock, and Off-Line operation functions.

Both terminal emulators are supplied on the same diskette.

(List Price: $599)

Requires: 64K RAM, one disk drive, PC-DOS, bisync adapter board.

Software Dynamics, Inc.
P.O. Box 247
Dunedin, FL 34296
(813) 733-8784

CIRCLE 757 ON READER SERVICE CARD

Virtual Disk(ette) Access Method (VDAM)

A program allowing users to store and access data in PC format on a mainframe system. With *VDAM*, the mainframe appears as a series of diskettes or hard disks to any program running on the IBM PC. Thus, data stored on the mainframe is directly accessible to the user's system using standard DOS directory interfaces and commands.



***Terminal Emulator Software**, Software Dynamics, Inc.*

Used with a communications port, *VDAM* acts as a transparent method for a PC to take advantage of the storage capacity of mainframe systems to store data in a form the user's system can use directly. Information stored on the mainframe's disks can be accessed by multiple PC users with authorization. *VDAM*'s virtual disks are stored on the mainframe as standard VSAM files, providing audit security trails and backup support inherent in the mainframe environment. All binary and text file types are supported.

(List Price: $500 per node; host license fee $3,000)

Requires: PC: 128K RAM, one disk drive, PC-DOS 2.0, communications port, 3270 terminal emulation software. *Mainframe:* MVS TSO operating system, 3274/3276 controller.

Phaser Systems, Inc.
353 Sacramento St.
San Francisco, CA 94111
(415) 434-3990

CIRCLE 754 ON READER SERVICE CARD

FORMIX

A language-independent programming tool, composed of a run-time executive to manage data traffic between the user and the application program, and a set of interactive screen formatting tools for designing application program screens. This CICS-like system can also be used with screen-capture utilities to download CICS data to the user's system.

For creating screens, *FORMIX* provides a "paint the screen" mode where both the positioning and edit/validation criteria of all screen elements are defined interactively. Customized on-line help screens, messages, and screen prompts can be integrated with each application being developed, along with hard-copy printouts of screen documentation. Screen attributes such as reverse video, underlining, and colors can be configured as desired prior to screen creation.

FORMIX provides language interfaces to allow designed screens to be incorporated with BASIC, Pascal, C, and COBOL applications. The run-time executive of the software handles the screen I/O, messaging, and data editing/validation for the developed application. The program itself is written in ASM86 Assembler language for Intel microprocessors. Total run-

time memory requirements are less than 12K RAM.

Support programs are provided so that application screens can be tested, modified, and accepted by the user without a line of code having been written.
(List Price: BASIC version $495; Compiler language interfaces $495)
Requires: 64K RAM, one disk drive, PC-DOS.
Master Computer Systems, Inc.
9531 W. 78th St.
Eden Prairie, MN 55344
(612) 944-5220

CIRCLE 761 ON READER SERVICE CARD

Conquest

A game program that places the player in the midst of a prehistoric setting. Represented on-screen as a falcon, the player's aim is to fly higher than the enemy pterodactyl, swoop down, and collide from above. The player may also move the bird right or left in pursuit of the enemy circling the chasm below.

Every pterodactyl destroyed drops an egg that is worth extra points to the player if intercepted. Severe atmospheric conditions, such as hurricane winds, tornadoes, and tunneling drafts, as well as fire-breathing dragons menacing the player's figure, add to the game scenario.

Conquest allows either individual or two-player games, as well as choice of keyboard or joystick control. The top ten scores are saved to disk, and there are pause and sound on/off controls.
(List Price: $39.95)
Requires: 64K RAM, one disk drive, color/graphics adapter.
Windmill Software Inc.
2209 Leominster Dr.
Burlington, Ont.
L7P 3W8 Canada
(416) 336-3353

CIRCLE 758 ON READER SERVICE CARD

PC 2622, Version 2.0

A terminal emulating program, permitting the user's system to emulate a Hewlett-Packard 2622A terminal when linked to a HP 3000 minicomputer. The software provides the user with all of the features of HP 2622A terminals and some of the features of the HP 2624 terminal, including security fields, two communications ports, and space substitution for tabs.

Like the Hewlett-Packard terminals, the *PC 2622* screen displays labels for eight function keys. However, the software itself makes multiple use of the IBM PC's ten function keys. The terminal emulator offers a choice of data transfer rates up to 19,200 baud, a printer buffer configurable up to 320K RAM, support for both parallel and serial printers, horizontal scrolling of lines as long as 10K characters, and configurable display attributes, including color on suitably equipped PCs. *PC 2622* also offers user-definable function keys, block and format modes, indicators showing cursor position and keyboard status, and menu-driven configurations for the terminal, for data communications, and for printer/device selection and operation.
(List Price: $295)
Requires: 96K RAM, one disk drive, PC-DOS, monochrome or color/graphics adapter, serial communications port.
Walker Richer & Quinn, Inc.
Lake Union Pl.
1914 N. 34th St., #201
Seattle, WA 98103
(206) 634-0503

CIRCLE 788 ON READER SERVICE CARD

Smarterm 100

A terminal emulation/file transfer program that allows the user to transfer either ASCII or binary program and data files to a host computer. The user can set up a single softkey to automatically perform a complete file transfer operation, even in "error-free" mode. A series of command sequences permit the host computer system or another PC to remotely control the PC's operation. The host system can change softkey values, initiate and control file transfer operations between the PC and the host system, and even terminate *Smarterm 100* operations.

The startup command file facility permits the user to define a series of commands that are performed automatically when the program is started. With this feature, the program can automatically select a setup configuration, auto-dial a host system, log on, transfer a file, log off, and return to DOS. File transfer functions permit a user to "capture" data being sent to the terminal into a disk file, and to transfer either ASCII or binary files to the host computer without specially programming the host computer. *Smarterm 100* can also transmit and receive ASCII and binary files over telephone lines by using a built-in protocol. This transfer mode can be used either between two PCs or between a PC and the host computer system.

The *Smarterm 100* disk includes fully functional sample BASIC and FORTRAN programs that implement the protocol.
(List Price: $149)
Requires: 128K RAM, one 320K drive, PC-DOS, Asynchronous Adapter.
Persoft Inc.
2740 Ski Lane
Madison, WI 53713
(608) 272-6000

CIRCLE 755 ON READER SERVICE CARD

FilePlan. Orga a spreadsheet organ

Here's the first electronic filing system that lets you see the big picture. On the IBM PC and most personal computers.



Like a spreadsheet, FilePlan™ puts data in rows and columns. You can scroll over your entire worksheet to see everything.

Type in any information you need to file and update—customer lists, expense records, addresses, projects due, personnel records, purchase orders.

It's easy because FilePlan works like you think. You don't have to set up a program. Just plunk in the data, *then* decide how you want to sort it, update it, retrieve it, combine it, display it on the screen and print it out. A menu of actions is always available. Help is a keystroke away.

If you'd rather see one entry at a time, just flip into "forms" mode. You can enter data either way.

The information is totally under your control.

Say you've made a file of customer orders with amounts and dates. FilePlan will automatically re-sort the list with every entry.

Then, before your next trip to Cleveland, you can:

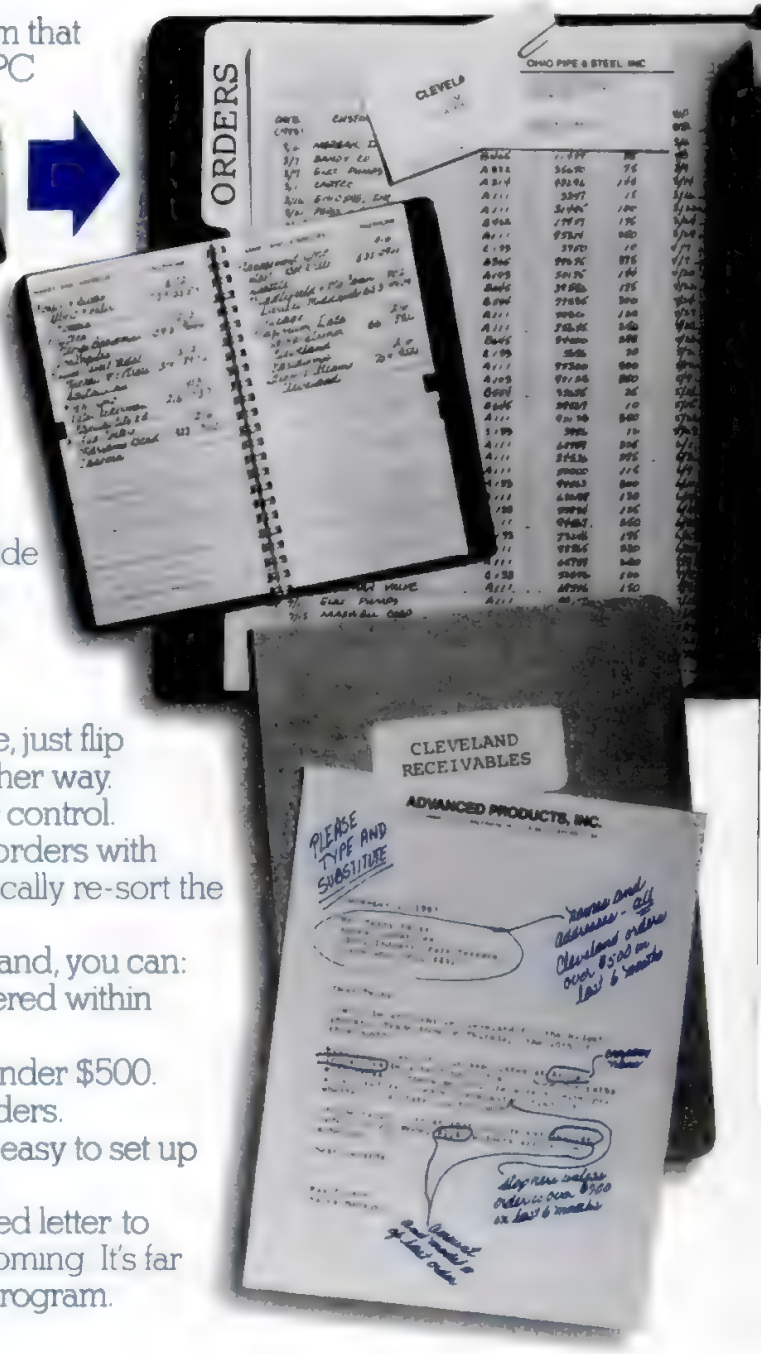
List everyone in Cleveland who ordered within the last six months.

Exclude anyone whose order was under $500.

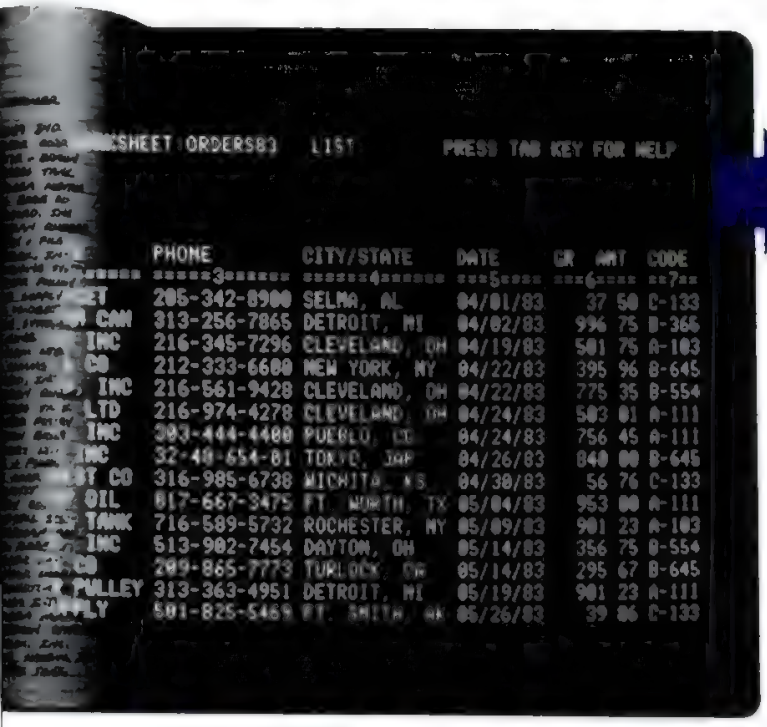
Rank the customers by their total orders.

Print out mailing labels. Formats are easy to set up with MemoPlan™ or any word processor.

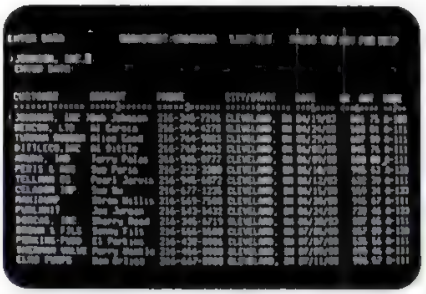
Have FilePlan generate a personalized letter to special customers so they know you're coming. It's far easier than using a typical "mail merge" program.



nizes your files like izes your numbers.



	PHONE	CITY/STATE	DATE	QR	AMT	CODE
ET	205-342-8900	SELMA, AL	04/01/83	37	50	C-133
CAN	313-256-7865	DETROIT, MI	04/02/83	996	75	B-365
INC	216-345-7296	CLEVELAND, OH	04/19/83	501	75	A-103
CO	212-333-6600	NEW YORK, NY	04/22/83	395	96	B-645
INC	216-561-9428	CLEVELAND, OH	04/22/83	775	35	B-554
LTD	216-974-4278	CLEVELAND, OH	04/24/83	503	01	A-111
INC	303-444-4400	PUEBLO, CO	04/24/83	756	45	A-111
INC	32-40-654-01	TOKYO, JAP	04/26/83	840	00	B-645
T CO	316-985-6738	WICHITA, KS	04/30/83	56	76	C-133
OIL	817-667-3475	FT. WORTH, TX	05/04/83	953	00	A-111
TANK	716-589-5732	ROCHESTER, NY	05/09/83	901	23	A-103
INC	513-902-7454	DAYTON, OH	05/14/83	356	75	B-554
CO	209-865-7773	TURLOCK, CA	05/14/83	295	67	B-645
PULLEY	313-363-4951	DETROIT, MI	05/19/83	901	23	A-111
LY	501-825-5469	FT. SMITH, AR	05/26/83	39	86	C-133





That's just a start. FilePlan eliminates most mistakes—or helps you correct them. If you forgot to include a category or need more room for a field, you can make changes any time. For someone who's inexperienced at data entry, just specify prompts and limit the kind of data allowed—for instance, nothing except five numerals under "zip code."

FilePlan even transfers data through our Link Module to MicroPlan,® Chang Labs' renowned financial planning spreadsheet.

You can pull sales figures from FilePlan, then do your projections with MicroPlan.

Just about anything you can imagine doing with information, FilePlan will do for you. Easier than you imagined.

See for yourself. There's a dealer nearby who'll give you a demonstration.

Chang Labs, 5300 Stevens Creek Boulevard, San Jose, CA 95129. (408) 246-8020.





Chang Labs

The family of software solutions

Available only from qualified dealers. Call toll-free for the name of the nearest Chang Labs dealer

(800) 972-8800

In California: (800) 831-8080

©1983 Chang Labs

International Distribution • United Kingdom Vector House, Phone 01-943-1257 • Belgium Vector International, Phone 32(16)202496 • Japan Software International, Phone 03-486-7151

CIRCLE 238 ON READER SERVICE CARD

Tax 4-5-6

A 1040 tax program for use as a template with Lotus' *1-2-3* software. The user can enter data on various IRS forms, while a fixed window on the lower portion of the screen displays the gross income, deductions, taxes, credits, and so forth.

A sample program displays various entries on over 17 tax forms and provides an empty template for your own return. The program includes a help section as well as a detailed instructional manual. In addition, the program comes with IRS publication #17, "Your Federal Income Tax."

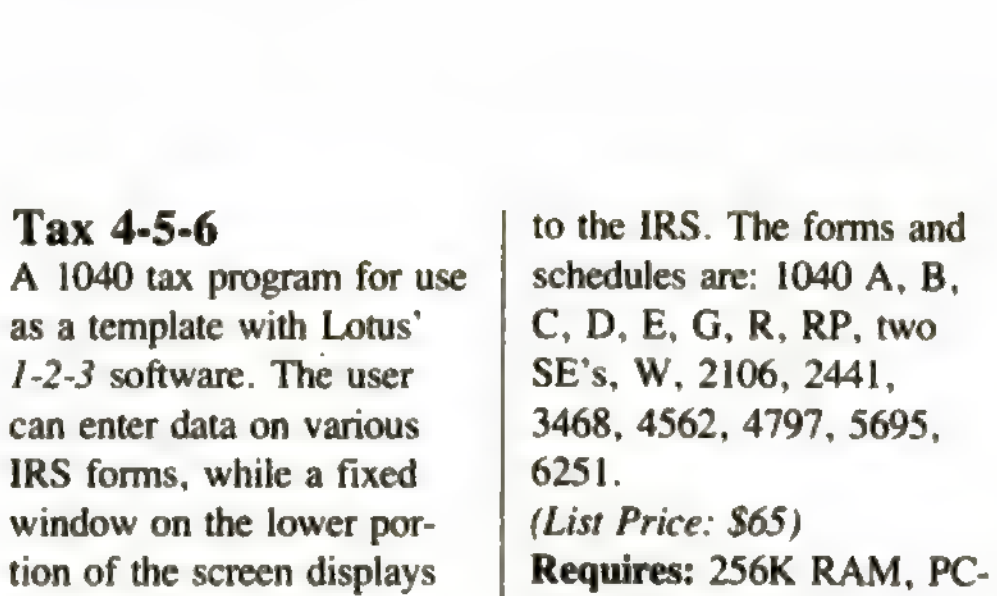
With two keystrokes, *Tax 4-5-6* prints all or specified forms. All forms, except for the 1040, have been approved for mailing to the IRS. The forms and schedules are: 1040 A, B, C, D, E, G, R, RP, two SE's, W, 2106, 2441, 3468, 4562, 4797, 5695, 6251.

(List Price: $65)

Requires: 256K RAM, PC-DOS, Lotus' *1-2-3*.

Austin Scientific, Inc.
1259 El Camino, #260
Menlo Park, CA 94025
(415) 323-6338

CIRCLE 786 ON READER SERVICE CARD



Tax 4-5-6, Austin Scientific, Inc.

PC Illustrator

A general-purpose graphics program for creating, editing, and presenting graphics images such as computer art, word charts, maps, graphs, and flow charts. Pictures created with the software can be printed on dot matrix or ink jet printers and may be saved to disk and viewed within slide shows.

PC Illustrator uses icon menus—symbolic pictures representing the selections and locations of commands. The program allows the user to create images with a variety of "brush" strokes and offers a range of line widths, rectangles and squares, bars, and circles. Other features include a curve generator, high-resolution picture editing capability, picture "cut and paste" operations, color area fill, and the ability to copy and move pictures or parts of pictures to other files. The user can control the size, spacing, text angle, and character slant of the program's high-precision text, which comes in eight different fonts.

A library of commonly used graphic symbols can be created to speed up the creation of flow charts, drafting, electronic schematics, and architectural designs. The program can accommodate digitizing pads, digital mice, joysticks, the Koala Pad, lightpens, or keyboard to make menu selections and create images.

(List Price: $119.95)

Requires: 128K RAM, two disk drives, PC-DOS, color/graphics adapter.

Computer Graphics Group, Inc.
568 14th St., NW
Atlanta, GA 30318
(404) 876-9469

CIRCLE 752 ON READER SERVICE CARD

VTERM II

A communications program emulating the DEC VT100 terminal. The software permits the user's system to hook up to any Digital Equipment Corp. mainframe, running all of the host system's software unchanged. Files can be transferred using any of four different protocols, including XMODEM and the VTRANS 7 and 8 bit protocols. The latter provide CRC-16 or checksum error detection capabilities.

Other features of *VTERM II* include:

- Sample host software for the DEC RSTS/E and VMS operating systems, written in FORTRAN and BASIC+;
- *DOS-VTERM*, which allows users to leave *VTERM II* to execute local DOS commands or other programs, then return to *VTERM II* with the original terminal screen and communications link intact;
- Full VT100 keyboard emulation, including Break, No-Scroll, Cursor Keys, and Keypad Application modes;
- 20 Soft Function Keys, allowing users to define strings of up to 66 characters in length, including special embedded commands to facilitate autodialing and log-on;
- Full VTXX-AC and VT102 printer support.

VTERM II's output can also

be routed to PC disk files.
(List Price: $160)
Requires: 96K RAM, one disk drive, PC-DOS.
Coeficient Systems Corp.
611 Broadway
New York, NY 10012
(212) 777-6707

CIRCLE 759 ON READER SERVICE CARD

ACCESSORIES

Oak 170 Series Modular Furniture

A new line of modular furniture in solid oak and oak veneers, offering flexibility in configuration for maximum user comfort. The Oak 170 Series includes a desk, hutch, printer stand, corner connector, monitor/printer platform, and an optional locking door module. The furniture features an eight-step, hand-rubbed finish, with acrylic-coated work surfaces and nonglare finish.

The desk unit, Model CT-170, has a dual-level top with adjustable keyboard and CPU shelves. The left-hand surface can be lowered to typing heights of 27, 28, or 29 inches, and keyboards can be tilted at 5-, 10-, or 15-degree angles. The desktop's fixed half features a slim drawer underneath. A full-width lower storage shelf can be fitted with one or two optional locking door modules for secure storage of hardware or software. Equipment cords fit through a slot in the rear of the desktop to eliminate cord tangles.



Oak 170 Series Furniture, Bush Industries, Inc.

Also available in the Oak Series are a hutch unit with an adjustable monitor shelf, and a matching printer stand.
(List Price: Desk Unit $279.95)
Bush Industries, Inc.
312 Fair Oak St.
Little Valley, NY 14755
(800) 228-BUSH
(800) 248-BUSH in NY

CIRCLE 770 ON READER SERVICE CARD

ProTech Security Enclosures

A line of security enclosures and locking steel cables for the separate components of a user's system.

For the IBM PC, the manufacturer produces the ProTech PC Locking Stand, a 16-gauge steel enclosure for the systems unit that secures the unit to a work surface while leaving access to the disk drives. A supplied 21-inch steel cable attaches to any type of monitor to secure it to the enclosure. The Locking Stand can be mounted either horizontally or vertically.
(List Price: $155)
Segull Enterprises
65A Wheaton Ave.
Rehoboth, MA 02769
(617) 336-4172

CIRCLE 774 ON READER SERVICE CARD

Eye Care CR-39 Lenses

A line of eyeglasses designed to minimize or eliminate many of the problems associated with prolonged viewing of a CRT display screen. The CR-39 lenses are polarized to admit light from one direction only, minimizing ambient light reflections that glare off a display screen. The eyeglasses also reduce the brightness of a screen to below the level where the human eye can discern flickering, a source of visual fatigue.

Additional benefits from the CR-39 eyeglasses include the absorption of low levels of X-rays, microwaves, and other types of ultraviolet radiation emitted by the CRT screen.

The eyeglasses are available in a range of sizes and styles, in chrome or plastic frames. Clip-on versions, for attaching to a user's own eyeglasses, are also available.
(List Price: $14-$34, depending upon style)
Pacific Trade
16 Emery Bay Dr.
Emeryville, CA 94608
(415) 655-9340

CIRCLE 773 ON READER SERVICE CARD

PUBLICATIONS

The Ratings Book

A comparison review of 30 word processing programs for the IBM PC. In addition to numerical ratings based on multiple testing, the book also contains 39 comparative rating charts, summaries of the test results for each program, and a total of 180 screen pictures showing how the menu and editing screens compare.

The book is the result of 2 months of testing by ten staff evaluators. All programs were tested for ease of start-up, learning, and use, as well as error handling, performance, versatil-

MICROMAIL™

THE PC SYSTEM SPECIALIST

PRICES AND AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE



SPECIAL OF THE MONTH

TAVA PC™

A Superior quality IBM PC Compatible Personal Computer. *Runs DOS 1.1, 2.0, 2.1, CP/M86®, UCSD p-System®, Runs Lotus 1-2-3®, Multi-plan®, WordStar®, PFS®, dBASEII®, and many more! Hardware includes 128K CPU, Floppy Controller, Two DS/DD Disk Drives, Video Monitor, Video Adapter, Parallel & Serial Ports.*

CALL FOR LOW PRICE
Suggested List $2395.00

FREE Lotus 123 or Gemini 10X with TAVA purchase.



IBM® PERSONAL COMPUTER

Special of the Month!

IBM PC* COMPLETE LINE

COMPLETE SYSTEM VERY SPECIAL PRICE

64K, Two Disk Drives, Floppy Disk Controller, Video Card and High Res Monitor **$2399**

256K RAM, 360KB Disk Drive, FDC, Video Monitor & Adaptor 10MB Hard Disk Sub-System **$3990**

PRINTERS

OKIDATA 82	*120 cps*	**CALL**
OKIDATA 92	*160 cps*	**CALL**
OKIDATA 93	*160 cps*	**CALL**
OKIDATA 84	*200 cps*	**CALL**
EPSON FX 80	*160 cps*	**$499**
EPSON FX 100-160 cps		**CALL**
NEC 3550		**$1899**
DYNAX DX-15	*13 cps*	**$450**
BROTHER HR-1	*16 cps*	**$599**
BROTHER HR-25	*23 cps*	**$749**
GEMINI 10 X	*120 cps*	**CALL**
GEMINI 15 X	*120 cps*	**CALL**

DISK DRIVES

SLIM LINE	*QUMETRAC 142*	**$199**
	TOSHIBA	**$205**
	PANASONIC	**$199**
FULL SIZE	*TANDOM TM 100-2*	**$199**

PERIPHERAL CARDS

AST	*SIXPACK PLUS 64K*	**$299**
	MEGA PLUS 64K	**$299**
	I/O PLUS-1s, 1p, c	**$190**

PERIPHERAL CARDS

GAME/SERIAL/PAR	**$39**
64K MEMORY	**$50**
MONOGRAPHIC	**CALL**
HERCULES GRAPHICS CARD	**$369**
PLANTRONICS COLOR PLUS	**$439**
QUADRAM COLOR I/II	**CALL**
PARADISE MULTI-DISPLAY	**$489**

MONITORS

AMDEK	*300 G*	**$149**
	300 A	**$159**
	310 A	**$169**
PRINCETON	*HX-12*	**$490**
	SR-12	**CALL**
	MAX-12A	**CALL**
ROLAND	*MB-122 G*	**$139**
	MB-122 A	**$149**

MODEMS

HAYES	*1200B*	**CALL**
	1200	**CALL**
	300	**CALL**

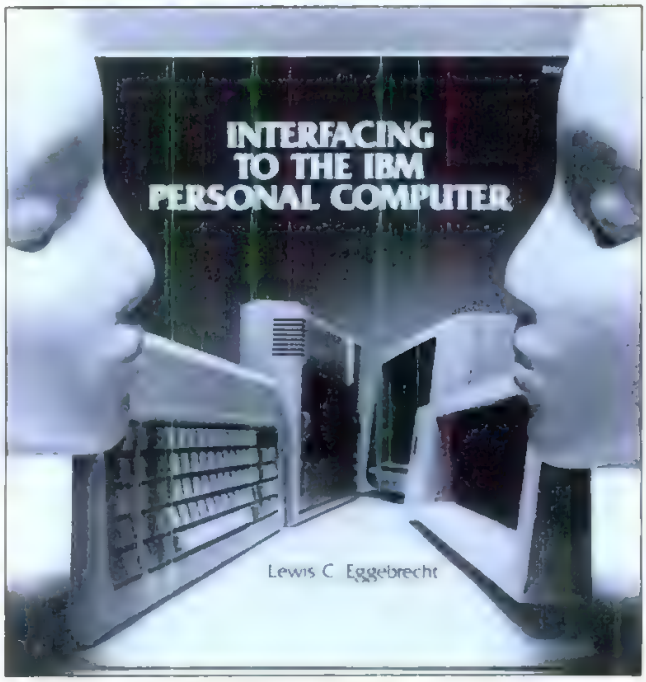
MICROMAIL
631 E. First St., Tustin, CA 92680

(714) 838-9100

*IBM PC is a registered trademark of IBM Corp
dBASE II is a registered trademark of ASHTON TATE Inc
LOTUS 1 2 3 is a registered trademark of Lotus Development
Wordstar Spellstar Mailmerge are registered trademarks of Micropro International
Visicalc is a registered trademark of Visicorp

Multiplan is a registered trademark of Microsoft Corp
PFS is a registered trademark of Software Publishing Co
CP/M86 is a registered trademark of Digital Research Inc
MS DOS is a registered trademark of Microsoft Corp
UCSDp is a registered trademark of Softech Microsystems*

CIRCLE 201 ON READER SERVICE CARD



***Interfacing to the IBM PC**, Howard W. Sams & Co., Inc.*

ity, overall evaluation, and value for money. Each of the 30 programs was put through the same series of standardized tests ten times, by testers with varied levels of experience. Scores were then averaged for each element of evaluation to reduce the possibility of bias, and final ratings were calculated by computer.

(List Price: $14.95)
Software Digest, Inc.
1 Wynnewood Rd.
Wynnewood, PA 19096
(215) 649-7000

CIRCLE 779 ON READER SERVICE CARD

Interfacing to the IBM PC

A handbook of technical information on the IBM PC, written by Lewis C. Eggebrecht. Author Eggebrecht designed the motherboard, RAM cards, printer and communications ports, and other components of the PC for IBM. In *Interfacing to the IBM Personal Computer*, Eggebrecht covers the basic principles of the PC's BUS cycles, interrupts, Direct Memory Access (DMA) functions, and other technical aspects of the machine's operation.

Also covered are 8086/8088 Assembly language subroutines for interfacing hardware with existing software, and BASIC programs that demonstrate specific hardware functions. PC DOS and DEBUG are covered in depth, and a chapter of the book is devoted to adding new drivers to the BIOS. Five design examples detail the development of useful system hardware additions.

(List Price: $15.95)
Howard W. Sams & Co., Inc.
4300 W. 62nd St.
Indianapolis, IN 46268
(317) 298-5400

CIRCLE 660 ON READER SERVICE CARD

SERVICES

One Point Electronic Catalog

An on-line database and product distribution service, featuring descriptions and evaluations of IBM PC software. Users can purchase software from the service, which offers discount prices on many packages.

The *Catalog*'s format permits the subscriber to browse through product data by generic category, or by a program's title, manufacturer, or subject area. Many of the database's operating commands and help screens can be accessed with single keystrokes.

The *Catalog*'s product information is supplemented by the One Point News Hotline, which features microcomputer industry news.

(Start-up Fee: $100)
ITM
2835 Mitchell Dr.
Walnut Creek, CA 94598
(800) 334-3404
(415) 947-0850

CIRCLE 780 ON READER SERVICE CARD

New on the Market Submission Guidelines

1. Please include the retail price, distribution methods, and details of both hardware and software requirements needed for an end-user to properly use your new product. For software especially, this includes required amount of RAM, number and type of disk drives, operating system(s) supported, and any peripheral equipment needed.

2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.

3. Include telephone contacts for marketing and technical questions.

4. If available, include black & white glossy photos of the product, 4 × 5 in. or larger.

Please note that all products are run on a space available basis. It is impossible to guarantee publication of a product announcement for any particular issue.

Inclusion in **New on the Market** is at the exclusive discretion of the editors.

PC BlueBook

Rates and Information

PC: BlueBook is a high-response, low-cost source for advertising in the fastest growing computer market in the world. Advertisers choose between set categories and may include a logo. Display advertisers may cross-reference to their current display ad.

Circulation: 150,000 Paid Circulation Rate Base. Readership: 300,000 Est.

AD STYLE

1 line Heading (25 characters maximum). 7 lines Body Copy (45 characters per line). 4 lines for Company name, address and telephone.

RATES

Per Issue: $150. Additional Lines: $15 per line. Logos: $300 (4 issues). Minimum Order: 4 issues. Terms: Prepayment is required. Check, money order, American Express, Diners, VISA or MasterCard are accepted.

DEADLINES

July 12th for the September 18th issue, on sale August 28th. Send your ad and prepayment to: PC BlueBook, Classified Advertising, 12th Floor, One Park Avenue, New York, NY 10016. Advertising sales: (212) 725-4215. Customer service: (212) 725-4312

ACCESSORIES FURNITURE

EXECUTIVE FURNITURE
For Executive Computing. Finely finished hardwood furniture for your IBM PC. Monitor stand positions easily & tilts. Computer stand mounts system unit vertically. Each handcrafted matched set available in Oak, Cherry, or Walnut. Set: $330. MC/VISA. Free brochure. Write or call:
PC STAND-UPS
120 Franklin Road
Oakridge, Tenn. 37830-0367
(615) 483-6411

ACCESSORIES SUPPLIES

COMPUTER PRODUCT GUIDES
At $6.95, the ISS matchbook gives you over 1800 products at your finger tips, all cross-referenced to over 14,000 different models of office and computer equipment. For $3.95, the ISS CATALOG lists over 5,000 computer and media products, in color and conveniently priced—FREE with order. VISA, MASTERCARD.
INDUSTRIAL OFFICE OUTFITTERS, INC.
320 Fentress Boulevard
Daytona Beach, Florida 32014
(904) 255-5406 in FL (800) 342-4581

MAXELL DISKS/FLIP N FILE
MD-1 (s/s d/d) Bx10 25.95, MD-2 (d/s d/d) Bx10 37.00. Flip n File 25: 19.95, Flip n File 15: 6.95; Flip n File 50 w/lock: 29.95; Flip n File 50 original: 19.95. Call or write for information and price list. California residents please add 6.5% sales tax.
ETA Systems
366 Allendale
Pasadena, CA 91106
(213) 945-1931

DISKETTES + FREE SOFTWARE
For IBM PC, ALL 10 diskettes—only $29.95 DS/DD 3—year guarantee.
Plus*****
SOFTWARE Includes:
Labels, invoicing, calendar, games, IBM utilities....30 TOTAL.
$29.95 + $2.00 shipping. VISA/MC, check/MO.
GLC SYSTEMS
2729 Winchester Pike
Columbus, Ohio 43232
(800) 332-1225, outside of Ohio (orders only), (614) 237-1077 in Ohio.

BUSINESS OPPORTUNITIES

ENERGY MGMT—GE TIME SHARE
Entrepreneurs needed to establish Dealers and generate sales for incredible new Energy Conservation Analysis System. Includes hardware, software, and royalties from access to massive energy data base and programs on General Electric's Nationwide Timesharing System. IT'S WORTH A CALL!
GENERAL ENERGY TECHNOLOGIES
250 E. 17th St., #G
Costa Mesa, CA 92627
Box 2062 Newport Beach, CA 92660
(714) 645-7733

VENDORS & DISTRIBUTORS
WANTED: Independant software vendors, distributors & consultants for nationwide software distribution network. SOFTWARE VENDORS-Do you have limited resources for nationwide distribution? DISTRIBUTORS/CONSULTANTS-Are you looking for new software packages to represent? Call Ed Sager for details & application.
SGR SYSTEMS, INC.
STATION SQUARE III Suite 207
Paoli, PA 19301
(215) 296-7566

COMPATIBLES

PANASONIC SR. PARTNER!
IBM PC compatible portable—8088 CPU, 128K memory, dual 360K drives, 9" green screen, built in thermal printer, parallel port, serial port, RGB port. Software included: MS DOS 2.11, Wordstar, Visicalc, pfs file, pfs report, pfs graph, G.W. basic. Send cashiers check or M.O. for $2495 shipped. Wisconsin res. add tax—90 day warranty, all sales final.
DISCOUNT COMPUTER ACCESSORIES
445 North Pine
Reedsburg, Wisconsin 53959

COMPUTER TRAINING

IBM XT TRAINING VIDEO TAPE
No time to read manuals? Bypass them with this amusing instructional video! In 30 minutes this tape explains the basics including, technical jargon & parts of the machine, the disk operating system, beginning setup procedures, special keys & important commands. Avail. VHS, BETA 1&2 $49.95.
H.E.R. PRODUCTIONS, INC.
2500 Kuhio Ave.
Honolulu, HI 96815
(808) 922-0811, Attn. Kiku Rolles

THE TRAINER
"How to use your PC in 10 easy video lessons" for the IBM PC and XT. An award-winning video that makes you computer literate in 4 hours. Suggested retail ... $69.50 in Beta and VHS. Coming soon-PCjr and several generic software titles. Just released Interactive Video-disc. Tutorial demo for the IBM PC.
KENNEN PUBLISHING
150 Shoreline Hwy., Bldg. E
Mill Valley, CA 94971 (800) 428-7777
(415) 332-5828 in Cal.

1-2-3-™VIDEO TRAINING!!!
The FASTEST-EASIEST-CLEAREST 1-2-3 training on the market ... in use by: IBM, Exxon, US Army, Dept. of Educ., GM, Boeing, GE & many more! SELF-PACED, PLAIN ENGLISH, HANDS-ON teaching. "Intro to 1-2-3" is a 2 hr. 23 min. videotape, disk, guidebook .. xtra book/disks for seminars!



LEARN-PC VIDEO SYSTEMS
3601 Wooddale Avenue South
Minneapolis, MN 55416
800-LEARN-PC (800)-532-7672

CONSULTANTS

GEORGIA
CUSTOM PROGRAMS/SUPPORT
Why have someone else's software when you can have your own? We write programs to meet your requirements and solve your problems. Business and health care management applications a specialty. Over 15 years experience in data processing. Let it work for you!
YOUR SOFTWARE CO.
2980 Queens Ct.
Norcross, GA 30071
(404) 448-1274

BLUEBOOK

DISKETTE COPY SERVICE

EACH A PERFECT ORIGINAL
Duplication and formatting for virtually all popular personal computers. Downloading 8 inch CP/M to most 5¼ inches CP/M. IBM EBCDIC to CP/M conversions. We are experts in IBM 1S and 2S duplication. Copy protection for IBM-PC. Downloading CP/M 8 inch or CP/M 5¼ inches to IBM-PC DOS or CP/M-86. Five days turn around for orders 2 K quantity.
DISCOPYLABS
1600 Wyatt Drive, Suite 10
Santa Clara, CA 95054
(408) 988-0438

ALLENBACH INDUSTRIES, INC.
Allenbach created the industry, and we've since been imitated—but never duplicated. Copies supplied on OEM quality Allenbach LIFETIME GUARANTEE diskettes, now available in a variety of colors. Virtually all formats and systems. Copy protection, serialization, downloading and packaging available. Rapid delivery on 100 to 1,000,000 copies.

ALLENBACH INDUSTRIES, INC.
2101 Las Palmas, Suite A
Carlsbad, CA 92008
(800) 854-1515, (619) 438-2258

BLANKET ORDER SERVICES
Diskette duplication, packaging, stocking and drop-shipping services based on your long-term needs. Place a blanket order with releases as you need them for large or small quantities at a fixed price. No extra charge for "mastering", label printing or application.
STAR-BYTE, INC.
2564 Industry Lane
Norristown, PA 19401
(215) 539-4300

COMPUTER MEDIA PRODUCTS
SOFTWARE DUPLICATION AND formatting on OEM quality diskettes. Copy protection, serialization, custom packaging and private labeling available. Conversion and downloading for CP/M and MS-DOS. Guaranteed fast delivery. A dealer that carries accessories and supplies. Master distributor for Verbatim, Memorex, 3M & CDC.
COMPUTER MEDIA PRODUCTS
5482 Complex Street
San Diego, CA 92123
(619) 565-7802

9 TRACK TAPE TO DISKS
Conversion from ASCII or EBCDIC 1600 BPI magnetic tape (up to 16K blocks) to most 5¼ single, dual or quad diskettes. High speed automated process verifies transfer. Quality guaranteed. Only FIVE CENTS per thousand characters plus $3 per diskette. $50 minimum.
AUSTIN SCIENTIFIC INC.
1259 El Camino #260
Menlo Park, CA 94025
(415) 323-6338

GIVE YOUR SOFTWARE COLOR
Our color disks and color graphic disks can make your software stand apart from the rest. We offer rapid duplication in over 600 formats, including Commodore 64. We guarantee 100% verified flawless copies. Serialization, copy protection, labeling, packaging and shrink—wrapping also available.

Western Transdata Inc.
DISK DUPLICATION

Western Transdata, Inc.
1701 E. Edinger Ave.-Ste. A7
Santa Ana, CA 92705
Call (714) 547-3383 collect.

HARDWARE ADD-ON BOARDS

EPROM & MP PROGRAMMER
PC compatible PROM-2000 card can program 2716, 32, 32A, 64, 128, MCM 68764 EPROMS and also 8748/49/51 processors. The software (CP/M-86, PLDOS) can read, verify and program eproms and uses fast programming algorithm. The zero insertion socket is mounted on an external box. The external box for Bi-POLAR proms and PAL is also available.
ADVANCED MICROCOMPUTER SYSTEMS, INC.
6802 N.W. 20th Ave.
Ft. Lauderdale, Florida 33309
(305) 975-9515

GUARANTEED LOWEST PRICES
IBM PC with 128K and 2 disk drives-$2495. IBM PC with 128K, 10 MB hard disk (like XT)-$3795. Quadram 64K clock, serial, and parallel-$259. Tandon 360 KB DS/DD-$224. Amdek Color II monitor-$409. Hayes 1200B modem-$419. Printers, Software, IBM Compatibles, PCjr-at dealer cost + 5%
DATA GURU INTERNATIONAL, INC.
75-23 Broadway
Elmhurst, NY 11373
(212) 429-5178

AST/MAYNARD/QUADRAM/HAYES
AST MegaPlus (64K) $265, SixPack (64K) $265. I/O Plus $114. Extra Parallel, 2nd serial or game $35. MAYNARD Disk. Controller $159. Sandstar Series $Call. QUADRAM Quadboard $265. Quadcolor I $199. HERCULES card $349. Set of nine 64K chips $55. HAYES modems $Call.
VLM Computer Electronics
10 Park Place
Morristown, NJ 07960
(201) 267-3268

PCool™—COOLING FAN
Solves heat related problems from expansion cards and/or hard disk. Mounts on front of PC or XT chassis, behind front bezel. Fan is not visible. Easy installation, all parts included. PCool™ retails for $99.95 (US funds), plus shipping. Call or write for more information. Quantity discounts available.
ANALYTIC INFORMATION PROCESSING, INC. (AIP)
P.O. Box 966
Danville, CA 94526
(415) 837-2803

64K RAM EXPANSION KIT
Set of 9 factory new, tested, burned-in 150NS RAM chips suitable for use in PCII's, XT's workalikes, and memory expansion boards. Satisfaction Guaranteed or money back. Static-shielded shipping. $57.50 Set + 2.50 shipping and handling. Quantity discounts available. VISA/MC, check, M.O., COD's for cash/cashier's check.
CORTEX INCORPORATED
603 W. 13th St., Suite 1A-263
Austin, TX 78701
(800) 237-8400 X333/(800) 282-1469 X333 in FLA.

MULTIGRAPH BOARD
Monochrome and color display adapter compatible with IBM PC. Monochrome graphics (LOTUS 1-2-3 compatible) with 720H X 350V resolution. Expandable options include "Soft-scroll" smooth scrolling, 132-column display, high resolution color graphics in 16 colors, and more. Price base configuration $499.00.
PROFIT SYSTEMS, INC.
30150 Telegraph Road
Birmingham, MI 48010
(313) 647-5010

TOTAL PC/XT COMMUNICATION
ELECTRONIC SYSTEMS ENGINEERING proudly introduces two extremely versatile and powerful communications adapters for the PC/XT and compatibles. One is RS-232C serial, the other has 3 fully programmable 8 line parallel parts. Both have full 64K selectable I/O address decoders. Price is $139.50 each.
ELECTRONIC SYSTEMS ENGINEERING
PO Box 572 D.T.S.
Portland, Maine 04112
MC/VISA (207) 773-7778

ULTRA-RES GRAPHICS
HIGH RESOLUTION graphic systems for the IBM-PC/XT. Display resolution programmable to 512×512 or 1024×1024. High speed vector/arc drawing, hardware zoom, windowing, scrolling and character writing. Multiple controllers may be synchronized, software drivers included, direct drive or analog output. Prices from $495.
C.S.D. INC.
P.O. Box 253
Sudbury, MA 01776-0253
(617) 443-2750

BOOT PC FROM HARD DISK
FiXT boots from DATAMAC, DAVONG, PEGASUS, PERCOM, GREAT LAKES, XEDC others. Adds XT-like BIOS interface for your disk to IBM PC2. Ends need for installable device drivers. DOS 2.0/2.1 reqd. Plug-in installation. Specify disk/controller model with order $70, $3 shipping. (CA orders add 6%) MC/VISA.
GOLDEN BOW SYSTEMS
PO BOX 3039
San Diego, CA 92103
(619) 298-9349

HOLDS YOUR ADD-ON BOARDS
PC Expansion Box provides 6 added slots. Ideal for adding a variety of PC add-on cards for growth. No software changes required. Simply plug in card & connect cable to PC. Compact. Runs quietly. Easy internal access. Available w/ or w/o power supply, fan, cover, & bezle. Prices from $309. Free data sheet.
DATA/WARE DEVELOPMENTS, INC.
4204 Sorrento Valley Blvd. Dept. BB
San Diego, CA 92121
(619) 453-7660

HARDWARE COMMUNICATIONS

VOICE RECORD/SEND, + MODEM
NATURAL CONNECTION™ for PC answers your phone, takes voice messages, sends voice messages. Is 300 (opt 1200) band modem, calendar & dictation unit. Autodials 500 numbers. All digital integrated sftwr. Satisfaction guaranteed. VISA, MASTERCARD. Order Now. Only $849.
NATURAL MICROSYSTEMS CORPORATION
19 Brook Road
Needham, MA 02194
(617) 449-6070

HARDWARE DISK DRIVES

SMD HARD DISK CONTROLLERS AND SUB SYSTEMS
Interphase brings you the most powerful disk controller and disk subsystems available for your IBM PC or PC compatible. You can use any of the dozens of high performance Disk Drives supporting the industry standard SMD Interface. Capacities range from 16 to 1600 Megabytes, speeds 3-5 times the 5.25". Winchesters and reliable removable media too. Ideal for network file servers or large DBM applications.
Interphase Corp.
2925 Merrell Road
Dallas, TX 75229
(214) 350-9000

BLUEBOOK

DISK DRIVES FOR PC

Qume 142A (½ Ht) : $209
Teac FD55B (½ Ht) : $209
TM100-2, DS, 40T : $209
TM101-4, DS, 80T : $315
CDC 9409 DS, 40T : $235

MAYNARD complete Internal 10MB Winchester Hard Drive System: from $959. VISA/MC or COD.
VLM COMPUTER ELECTRONICS
10 Park Place
Morristown, NJ 07960
(201) 267-3268

HARDWARE/ DISKETTES

SPECIAL OFFER BASF DISKS

Super savings—high quality at low prices. BASF Qualimetric 5¼" SS/DD; $21.00/bx of 10. BASF Qualimetric 5¼" DS/DD; $28.00/bx of 10. All qualimetrics carry lifetime warranty. Shipped UPS COD. Send check (allow for clearance), M.O. or call in Visa/MC. Minimum order 2 boxes.
Denko Sales Corp.
7925 N.W. 12th St., Suite 225
Miami, Fl 33126
(305) 594-4940

DISK Doubler Kit

Double your present media storage capacity and SAVE 50% on future disk purchases. Converts FLOPPY DISK to FLIPPY in less than 1 minute. Kit comes complete with EASY TO FOLLOW INSTRUCTIONS. Use with any 5.25 single side disk. Pays for itself SAME DAY! #ETCDD ONLY $19.95 ea. $2.00 S&H. M/C, VISA, MO, COD (+ $1.85), CHECK.
MAGNETICS, INC., PO Box 98,
South Grafton, MA 01560
1-(800) 334-DISK (617) 839-4404

OMNI INTELLIGENT DISK

NOW, a flexible disk that warns you of impending failures BEFORE they happen! Patented data protection sensors warn of EXCESS HEAT & HUMIDITY. Disks certified at 65% CLIPPING LEVELS. The HIGHEST in the industry. #IN5121 SS/DD-box/10-$39.90. #IN5221 DS/DD-box/10-$49 90. $2.00 S&H.
M/C, VISA, MO, COD (+1.85), CHECK
MAGNETICS, INC.
P.O. Box 98
SO. GRAFTON, MA 01560
1-800-334-DISK (617) 839-4404

3M SCOTCH DISKS $18.50

SS/DD 5.25" $18.50 DS/DD 5.25" $25.50. Ultra-magnetic bulk SS/DD $23.50/20 DS/DD $39 98/20 Supercalc 2 $125 less $15 rebate. Ribbons—C. Itoh/NEC 8023 $4.29 Epson MX70/80 $3.85. Flip-file storage 75 capacity $15.75. File Box 10 capacity $1.49. Labels $12.50/5M. Satisfaction guaranteed since 1977. CA res. add 6.5%.
ARGONAUT DISTRIBUTING
1104 Buchanan Rd.
Antioch, CA 94509
(415) 778-2595

HARDWARE PERIPHERALS

GRAPHICS ON YOUR DIABLO

The only complete printer buffer family! Print and compute at the same time. Buffers from 8K to 64K Bytes for either parallel or serial printers. Graphics models convert 1-2-3 and MBA graphics output into high quality dot graphics on letter quality printers. Units upgradeable to larger buffers and graphics. Proprietary double-buffering. Switch selectable hardware/software protocol. Cables and power supply included. Unique case mounts to side of PC without tools. Priced from $229.

ConvertaBuffer™

VonLeivendyke Enterprises
Silvermine Avenue,
Norwalk, CT 06850 (203) 846-4973

BAR CODE READER SUBSYSTEM

Consists of Bar Code wand, Decoder unit, cable to connect to Async port on IBM PC/XT or other compatibles, and interactive SW pack & Doc. Unit reads high, med., low density Bar Codes. Code 39, UPC, EAN, 2 of 5, 12 of 5, Codabar, Ames, Code 11, others. Various Baud rates. $895. Dealer pricing available.
DATAFLOW TECHNOLOGIES, INC.
8422 Bellona La., Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

ANYTHING AND EVERYTHING

Complete line of top quality, lowest priced peripherals for your IBM PC. Name brands include AST Research, Corvus, Microlog, Microsoft, Quadram, & Tecmar. Limited special on Shugart SA455 DS DD 320K slim drives—$185. Free shipping on all merchandise in continental U.S. Please call for complete catalogue.
MICRO CITY
24 W. 500 Maple Ave.
Naperville, IL 60540
(312) 355-9726

HARDWARE STORAGE DEVICES

SRI WINCHESTER SUBSYSTEMS

Internal 10 MB hard disk for IBM PC. WESTERN DIGITAL controller. Tested & formatted, complete kit $1050. No change in BIOS, boot from hard disk. Simple to install like a floppy, DOS 2.0. Several installed, 1 year factory warranty. Additional 10 MB hard disk $750. Tape back-up & removable HD systems available.
SRI DATA SYSTEMS
9 East Pleasant Avenue
Maywood, NJ 07607
(201) 684-4518

MAILING LISTS

IBM PC MAILING LIST

A plethora* of sales leads ... all IBM PC users. Cheshire or pressure sensitive labels. Zip code sort. $90 per 1000. Also post card packs. *plethora. more than 100,000.
FOOTHILL MARKETING
PO box 595
Tujunga, Ca 91402
(213) 352-7543

PUBLICATIONS

CATALOGS

PC BUYERS GUIDE

THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an Index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only $7.95 (+ $1.00 shipping/handling) to U.S. destinations; and $10.00 (+ $3.00 s/h), elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, NY, and VT, add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
P.O. Box 555
Morris Plains, NJ 07950

MIS COMPANY CATALOGUE

PC—DOS, MS—DOS and CP/M—86 software for the corporate community. Complete descriptions and requirements for over 300 business packages. Find out what software Fortune companies buy. Remit $5 for 52 page catalogue and information on corporate sales plan. We sell and support only quality software.
MANAGEMENT INFORMATION SOFTWARE COMPANY
475 Park Avenue South, 34th Floor
New York, NY 10016
(212) 686-0800

RETAILERS

HAWAII

COMPUTERLAND OF HAWAII

IBM PC and a full line of peripherals, software, and books. IBM authorized in-store and on-site service. Maintenance contracts and classes available. Call us for details.
Stadium Mall (808) 487-0030
Kawaiahao Plaza (808) 521-8002
46-208 Kahuhipa St. (808) 247-8541
Kaahumanu Center, Maui (808) 871-9566

SECURITY

PASSWORD CONTROL YOUR PC's

PC LOCK II allows file by file password and encryption protection. With the lock in place, your computer will not boot without entering a correct PW. Ideal for small multi-user environments. XT FORMAT wipeout protection. A 5" × 4" card with diskette, 38 changeable passwords. KEEP YOUR PC STRICTLY PERSONAL.

PC Lock II™

MPPI, LTD.
2200 Lehigh Rd.
Glenview, IL 60025
(312) 998-8401

DATA PADLOCK

DATA PADLOCK is a software implementation of the National Bureau of Standard Data Encryption Standard. Written in Asembler, DATA PADLOCK offers max speed with no increase in file size. An 8 character password provides the key for encryption. Protect sensitive data, text or program files from unauthorized access. Works with all DOS versions. $150. VISA/MC.
GLENCO ENGINEERING
3920 Ridge Ave.
Arlington Hts , IL 6004
(312) 392-2492

BITLOCK™ SECURITY

Guard your valuable software from PIRACY. Our inexpensive security system protects code using rapid decryption algorithms. Copies will only operate with a BIT-LOCK device attached BIT-LOCK's multi-layered security has proven its effectiveness on IBM PC, TRS-80, Apple and Commodore computers.
MICROCOMPUTER APPLICATIONS
7805 S. Windermere Circle
Littleon, Co 80120
(303) 922-6410

ELECTRONIC PC ALARM

New hardware security system permits movement of components but will sound an alarm when tampered with. System protects four items for less than $200. Call or write for additional information. Dealer inquiries invited.
SE-KURE CONTROLS INC.
5685 North Lincoln Ave.
Chicago, IL 60659
(312) 728-2435

BLUEBOOK

SOFTWARE ACCOUNTING

CUSTOM PAYROLL
All systems support multiple pay categories, calculation of all taxes, user-defined deductions, exceptional item handling, a variety of necessary reports, paychecks and W-2 forms. Written in PC Basic with full source included for easy maintenance. Prices start at $400.00 for basic system and manual.
DATASMITH, INC.
Box 8036
Shawnee Mission, KS 66208
Phone: (913) 381-9118

ACCOUNTANTS SOFTWARE
Finally! A software source for the practicing accountant with programs designed especially for the professional practitioner. Tax Planner, Depreciation, After-The-Fact Payroll. Form #1099 Generator, Account Analysis and Client Information System are just a few of many. Call or send for our complete catalog.
OMNI SOFTWARE SYSTEMS, INC.
145 North Broad Street
Griffith, IN 46319
(219) 924-3522

ARCHITECTS AND ENGINEERS
AEMAS System is designed specifically for architects, civil engineers & other professional firms where monitoring project costs is required. Modules available are job costing, payroll, A/R, A/P, general ledger & automatic invoicing. Interactive modules stand alone or run in any combination. Contact Bill Fraedrich.
DATA-BASICS, INC.
11000 Cedar Rd. #110
Cleveland, OH 44106
(216) 721-3400

MABS
(MABS) Merchant's Automated Business Systems. A menu driven accounting Software System for IBM and compatible Microcomputers. Features: Order Entry—$199.95; Invoicing—$99.95; Accounts Receivable—$99.95; Inventory Control—$99.95; Sales Analysis—$99.95; Mailing—$99.95; Bookkeeping—$199.95; To order call or write;
C.A. Richards, Inc./The Intern'l Computer Shop
218-81 Hempstead Avenue
Queens Village, NY 11429
Tel. (212) 776-5264/(212) 706-0452

DJBA PAYROLL CONTROL
Now even the most complex payroll is simple with this easy-to-use menu-driven program. Calculates all taxes and supports multiple wage rates or salaries and user-defined deductions. Prints checks. W2's, reports (current period, YTD summary, etc.) in order by name, employee #, SSn, or zip. Extensive error protection, foolproof data entry, password. Tax updates, minor customizing and full phone support included. Compilable. $300 complete.
D.J. BAILEY ASSOCIATES
3438 West 83rd Place
Chicago, IL 60652
(312) 434-6658

AMI RESTAURANT ACCT. SYSTEM
A system for restaurant and club management featuring daily purchases journal, average cost variance report, daily req. register, req. recap by item and dept, over and short comparison reports, month to date distribution, item cost, item usage analysis, item class, and prints physical inventory worksheets. System accounts for TEFRA and tip accounting. FUTA, SUTA reporting, prints W-2's, 941-A's, and QTD/YTD reports, Includes rest. inventory. G/L, A/R, A/P, and Payroll. List Price: $3,095. Req. 128K, two 320K disk drive or hard disk, PC-DOS 2.0, Monitor and Printer.
AUTOMATION MANAGEMENT, INC.
5718 Westheimer, Suite 410
Houston, TX 77057
Toll Free: 1-(800) 231-0634
In Texas: (713) 781-5941

AMI PUBLIC ACCT. SYSTEM
A system featuring a 17 digit chart of accounts, tailorable financial statements, after-the-fact payroll reporting, cost center detail reports, and processing of Prior Period Adjusting Entries, employee time analysis, client services and work in process reports on a current period and YTD basis. System includes T/A, client write-up. A/R, A/P and payroll. List $2995. Req 128K, two 320K disk drive or hard disk, PC-Dos 2.0, Monitor and Printer.
AUTOMATION MANAGEMENT INC.
5718 Westheimer, Suite 410
Houston, TX 77057 Toll free: 1(800) 231-0634
In Texas (713) 781-5941

INTERACTIVE BUSINESS SYSTEM
Integrated software package includes A/R with Order Entry/Commissions & Point-Of-Sale, A/P, Inventory Control/Bill of Material & PO, auto calculating payroll & G/L with Fixed Assets. 53 detailed reports, audit trails & automatic posting from all modules. Floppy or hard drive. Free brochure. Demo & Manual $25.



PERFORMANCE ENGINEERED PROGRAMMING
3970 Syme Drive
Carlsbad, CA 92008
(619) 434-6023

SOFTWARE BUSINESS

CHURCH SOFTWARE IN dBASE II
CHURCH INFORMATION MANAGEMENT system. ADAM II is a modular software package written in dBASE II by Melvin Schell, a nationally known church consultant and former IBM executive. ADAM II is the most comprehensive, easy-to-use church software available. It will run on virtually any microcomputer. For full information, call or write. Dealer inquires welcome.
OMEGA INFORMATION SYSTEMS
P.O. Box 450125
Atlanta, GA 30345
(404) 329-0091

TIME ACCOUNTING & BILLING
TABS is designed for use by professionals who bill on the basis of time (attorneys, accountants, etc.). User-friendly data entry and menu-driven program selection makes TABS easy to understand and operate. STI's full-feature software is currently in use by over 600 firms nationwide. For details contact:



SOFTWARE TECHNOLOGY, INC.
620 No 48th, Suite 120
Lincoln, NE 68504
(402) 466-1997

THE SALES MANAGER™
THE SALES MANAGER™ is a professional management information tool for executives in sales, marketing and general business. The system is integrated and handles the tracking and reporting for Customers, Prospects, Sales Representatives, Quota, Commissions, Planning, Forecasting Expenses, Sales Analysis and Personnel. The system easily handles perodic reporting. Importing and Exporting of Files, Linked Records and Multi-leveled Security. THE SALES MANAGER™ is designed to increase sales revenue by allowing the executive control of vital sales information. THE SALES MANAGER™ is easy to use, well documented, flexible, powerful and complete. Price $575.
MARKET POWER, INC.
1780 Rough and Ready Road
Rough & Ready, CA 95975
(916) 432-1200

TIME ACCOUNTANT
TIME ACCOUNTANT is an essential time-keeping and management tool for professionals. Functions include billing preview, invoicing and reporting by professional, client, project and activity. Specially formatted pocket calendar—time sheets supplied. Requires 128K RAM, 2 double sided drives or Winchester. Telephone support. 30 day return $495.
Time Accountant
636 Waverly St.
Palo Alto, CA 94301
(415) 328-7877.

EXPERT SYSTEMS FOR THE PC
Produce valuable knowledge-based systems now, and assess future impact, with EXPERT-EASE.™ "EXPERT-EASE is a fascinating new software package that, for the first time, allows experts in any field to create problem-solving 'expert systems' on a microcomputer ... one of the most interesting, thought-provoking programs to come along in quite some time." PC MAGAZINE, 2/21/84. $2000 U.S.+ $10 S & H
JEFFREY PERRONE & ASSOCIATES, DISTRIBUTORS
3685 17th St.
San Francisco, CA 94114
(415) 431-9562 or SOURCEMAIL BKP517

THE AHA EXPERIENCE
PMS-11, Primavera, shed-spread, Harvard Project Management and Schedules Systems. For managing any complex project—R&D, construction, business planning. 200-10,000 events on critical path, bar charts, resource management—capacity planning & load levelling. Training also. Profits on the critical path with Aha!—the project management software specialist.
AHA, INC.
109 S. River St./P.O. Box 8405
Santa Cruz, CA 95061-8405
(408) 458-9119

MYTE MYKE™ BUSINESS SYST
COMMERCIAL GRADE INTEGRATED PKG:
- BUSINESS PACK, o/e, p/o, a/r, s/a, a/p, g/l, i/c.
- MFG CTRL. Std cost, bom, oper rtg, lcst-sched, mpp, mrp, slc, where used, inventory control, production costing.
- PROTIME: time and billing

Install and sup. avail. CP/M, PC DOS, MS DOS, UNIX & more.
MDS Associates, INC.
P.O. Box 108
Orchard Park, NY 14127
(716) 662-6621

LP88—LINEAR PROGRAMMING
A GENERAL-PURPOSE system for solving linear programs with up to 255 constraints and 2255 variables. Features include menu-driven input/output, display editing, double-precision arithmetic, primal and dual solutions, sensitivity analysis, storage problems and bases re-start from a given basis, report generator. Required 128K, 1 disk drive, printer DOS. Recommended 192K, hard or electronic disk. Price: $88 for LP88 and user's guide.
EASTERN SOFTWARE PRODUCTS, INC.
P.O. Box 15328
Alexandria, VA 22309
(703) 360-6942

MILP88-MIXED INTEGER LP
A GENERAL-PURPOSE system for solving mixed integer linear programs with up to 45 integers, 255 constraints and 1255 variables. Solves problems by applying the branch and bound method. Menu-driven with many useful features simiar to LP88. Requires 192K, 1 disc-drive, printer, DOS. $88.
EASTERN SOFTWARE PRODUCTS, INC.
PO BOX 15328
Alexandria, VA 22309
(703) 360-6942

MASS MARKETING SYSTEM
Management & control of PROSPECT/CUSTOMER marketing data bases. System allows up to 30 profile codes per prospect which define different characteristics for each prospect. Selection of client upon AND/OR combinations of profile codes. Merges into WORDSTAR/MULTIMATE for custom letters. Analysis reports & mailing labels $99.00. U.S. Inquiries.
MSR, INC
230 Adelaide St. W./Suite 201
TORONTO, CANADA M5H 1W7
(416) 598-4982

BLUEBOOK

ROTOFILE FOR HOME/OFFICE
Your personal electronic ROTOFILE completely replaces "old tech" desk-top card files. Sort and search on any of 9 fields with room for up to 1,150 cards/disk. Includes 8 address fields and 4 user defined fields, help screens, much more. PC/XT, MSDOS. V/MC, check, MO accepted. Just $19.95!
IMAGINEERS
P.O. Box 3103
Tallahassee, FL 32315
(904) 386-3506

HOTEL-2000
Hotel Management software package for IBM-PC & compatible microcomputers. Includes all hotel functions: Reservations, Front-Desk, Housekeeping, Guest Accounting & Night Audit. Interfaces to most G/L & A/R packages for the Back-Office. A "user-friendly" system with "menus" & messages. Requires no previous computer experience. Written in MBASIC for maximum performance. Demo kits from $25.00. System modules $995.00 each. Dealer inquiries welcome.
UNIQUE INFORMATION SYSTEMS, INC.
221 North La Salle
Chicago, IL 60601
(312) 332-2829 TLX: 705071 Unique CGO UD

dINVOICER + PLUS
Menu-driven billing & accounts receivable management system. Produces Invoices, Aged Statements, Invoice Journals, Receipts Journals, Aged Customer Account Status, Packing lists, etc. Available with modifiable source code for dBASE II users $129, or as a stand-alone Run-Time™ package. $199. VISA/MC.
DATAMAR SYSTEMS
819 Gage Dr
San Diego, CA 92106
(619) 223-0444

TIME KEEPER (calendar)
A Calendar/scheduler featuring a weekly or monthly graphic display; multiple calendars, conference locating, copy or move appts. within or between calendars, search, tickler reminder, print selected appts., on—line help, user configuration files, plus much more. 192K PC-DOS 2.0 any printer. $195.
DuraSoft
7210 Washingon Ave.
New Orleans, LA 70125
(504) 486-6081

CALENDAR—SAVES TIME
FAST, graphic, effective time management. View year, month, week or day. Edit, copy, insert, delete, search and print time related information. Maintain multiple calendars on a single diskette. Store/repeat commands. Help. Requires PC-DOS 2.0, 128K, Mono or color. Send $85 (check or M.O.) for "KGcalendar."
KGourley Enterprises Inc.
Dept. MA1
PO Box 180760
Austin, TX 78718

USER CUSTOMIZED SOFTWARE
Complete system for setting up and running user applications to track administrative transactions. Includes file maintenance, input transactions with multiple file updates, scanning and editing, printed forms and reports. TRACKER II System $250. Optional TRACKPAC™ Application Kits $65. $3 shipping.

TRACKER II™ SYSTEM

ANALEX COMPUTING, INC.
5222 Richmond Road
Cleveland, OH 44146
1(800) 336-2966

POWERFUL BUSINESS SOFTWARE
Integrated Order Entry, Invoicing, Inventory Control, Accounts Receivable, Sales Analysis Pkg on most MS DOS Compatibles. Incl. history and forecasting graphics, multi-selective Mailing List module, Call Planning and Commission Statements. $695. Complete Demo package sample data $50. Refundable or applicable toward purchase

DISTRIBUTED COMPUTING SYSTEMS

DISTRIBUTED COMPUTING SYSTEMS
Martha and Randolph Sts., P.O. Box 185
Lombard, IL 60148
(312) 495-0121

INVESTWARE™
A portfolio management system that offers the investment manager comprehensive transaction processing, extensive record keeping, detailed reporting and systematic file editing and updating. A user can accumulate, prepare and present portfolio information. Investment managers $1995 Singler User $595, both w/comm.
NEMS
345 Whitney Avenue
New Haven, CT 06511
(203) 787-3452

P.B.M.S.™
- PEOPLE BASE MANAGEMENT SYSTEM™
- Exceptional "people-oriented" management tool used by: professionals, marketing managers, agents, clubs, associations, charities.
- Evaluate data on donors, members, customers, prospects, clients or any group of people.
- Exclusive database program can store, select, sort, retrieve, and print information using 32 descriptive fields per person.
- Transaction function can track dollar amounts and dates in additional fields.
- Built-in word processing and merge will print lists, labels, envelopes, letters, renewals, notices, appeals, receipts and more.
- WordStar™ and MailMerge™ compatible.
- Flexibility and sophistication unmatched in 100% menu-driven stream lined program.
- No programming required.
- List price $475. See your dealer now or call. US Inquiries.

MEDIMATICS SYSTEMS LIMITED
130 Malcom Road
Guelph, Ontario Canada N1K1B1
(519) 836-9201

SAVE $ ON TELEPHONE COSTS
Increase office efficiency with PHONECHECK The Telephone Manager for the IBM PC, XT and PCjr. Generates summary and detail reports necessary to allocate phone costs to departments, extensions, or to clients for bill back purposes. Discourages phone abuse. Helps determine need for WATS or SPRINT. $279.
PHONECHECK, THE TELEPHONE MANAGER
X10X CORPORATION (415) 571-7911
411 Boral Avenue, Suite 425
San Mateo, CA 94402

SOFTWARE
BUSINESS PROJECT MANAGEMENT

PRIMAVERA PROJECT PLANNER™
Critical path analysis for managers and planners. Offers interactive control of project activities, schedules, costs and resources—up to 10,000 activities in any work breakdown structure. Tabular and graphic reporting consistent with DOD standards; supports earned value analysis. Call or write for brochure.
PRIMAVERA SYSTEMS, INC.
29 Bala Ave., Suite 224
Bala Cynwyd, PA 19004
(215) 667-8600

MicroGANTT
Control your project! You describe the work, MicroGANTT calculates the schedule and budget. Time management, resource allocation, project tracking, personnel billing and fixed cost capabilities. Flexible critical path charts. Unlimited size and scope. PC—DOS, MS—DOS, CP/M—80. Free brochure. Demo available.
EARTH DATA CORPORATION
P.O. Box 13168
Richmond, VA 23225
(804) 231-0300

SOFTWARE
COMMUNICATIONS

TELEX LINK SOFTWARE
Link your computer to Western Union telex service via TWX or EasyLink. Cawthon's telex software is specially designed for telex communications and is easy to use, has on-line help, self-test diagnostics, frequently called numbers, and an excellent User's Guide. Cawthon's telex software is available for the IBM-PC and many other computers.

Cawthon Scientific Group

CAWTHON SCIENTIFIC GROUP
24224 Michigan Avenue
Dearborn, Michigan 48124
(313) 565-4000 Telex: 810-221-1265

"INTERCONNECT"
Let Dunham Data Systems InterCONNECT your computers. Help messages are there as you are asked each question, not just in the manual. Now your PC/MS-DOS, CP/M-86 & CP/M-80 systems can share data with complete error checking. Full terminal function with up/down load. Only $150, each additional CPU only $50.
DUNHAM DATA SYSTEMS
14216 Drexel
Omaha, NE 68137
(402) 895-8650

1-2-3 & VISICALC LOADER
LOADCALC converts text data downloaded from mainframes directly into 1-2-3 or VisiCalc. Handles mixed text and values without special formatting or programming. Now you can move your mainframe database into 1-2-3 or VisiCalc & DBase-II using just LoadCalc and your terminal program $95
MICRO DECISION SYSTEMS
Box 1392
Pittsburgh, PA 15219
(412) 276-2387

NEWTERM4—$35
PC communications solution with NEWTERM4! Remote terminal, file transfer, ARCHIVING, MARK & DUMP to disk or printer, SPLIT SCREEN (read buffered pages & do terminal processing at the same time), FUNCTION KEYS, on-line help & more. Easy to use. With software & manual $35; Above plus source (in Assembler) $95.
SIMPRO, INC.
PO Box 197
Gillette, NJ 07933
(201) 665-9492

EASY TO LEARN & USE—$95
Ideal for accessing public databases ... DIRECT. CONNECT was designed for those with little or no communications experience. Help is accessible from anywhere in the program. Manual written as Tutorial w/Quick Reference section for veterans. Xmodem protocol guarantees accurate data transfer. IBM PC. $95.

direct-aid

DIRECT AID, INC.
PO Box 4420
Boulder, CO 80306
(303) 442-8080

BLUEBOOK

SOFTWARE COMPILER

OPTIMIZING C86
C86 offers: highest UNIX compatibility "portable", as fast as any of our 22 competitors, full K&R with extras "save time", fast 8087, MSLink "integrate with MASM", library source "learn, do it your way", reliable, great text support, the most 3rd party libraries $395.00. Call for details.
COMPUTER INNOVATIONS
980-PB Shrewsbury Street
Tinton Falls, NJ 07724
1-(800) 922-0169

LATTICE C COMPILER
Now you can buy the finest 8086/8088 C compiler from the people who wrote it. Latest release supports 1 Mbyte addressing and PC-DOS Version 2. Single-unit price is $500. VISA/MC accepted. Call for quantity discounts, corporate licenses, and information about other compilers and cross-compilers.
LATTICE, INC
P.O. Box 3072
Glen Ellyn, IL 60138
(312) 858-7950, TWX 910-291-2190

DeSmet C-$109
Full K & R C Compiler, assembler, linker, librarian, full-screen editor and example software. Both 8087 and floating point libraries. Rated 1st or 2nd in 8/83 BYTE Benchmarks. Newsletter. No royalties on generated code. Unlimited updates $20/each. PC/MS DOS and CP/M-86. $109. Now available with source level debugger. Price $159
C-WARE
1607 New Brunswick Ave.
Sunnyvale CA 94087
(408) 736-6905

SOFTWARE DATA MANAGEMENT

FORM MANAGER
COMBINES data entry, data base forms processing, and spreadsheets. Design forms on screen. Use them for data entry retrieval & calculations. Does data entry validation. Report writer sorts any 3 fields. Prints labels, reports, based on your own criteria. Handles up to 32,767 records. $195. Demo disk-$15.00.
BIT SOFTWARE
P.O. Box 619
Milpitas, CA 95035
(408) 262-1054

MAG/base
A family of upgradeable, DBMS systems that grow with the user. MAG/base[1] for personal filing list mgmt, form letters. MAG/base[2] adds relational report writing using data from up to 5 files. MAG/base[3] adds custom application development. Easy. Powerful. Move up as needs grow. Prices. $295, $495, $795.

MAG® SOFTWARE INC.

MAG SOFTWARE INC.
21054 Sherman Way, Suite 305
Canoga Park, CA 91303
(818) 883-D8MS

RL-1 RELATIONAL DATABASE
- Menu operations for file setup, data input and report generation
- Extensive on-line help pages
- Command driven query language similar to SQL
- B-tree index with unlimited fields and keys.
- Interface to BASIC, FORTRAN, COBOL, PASCAL and ASSEMBLY

Run-time license available.
ABW Corporation
P.O. Box M1047
Ann Arbor, MI 48106
(313) 663-3011

PC-FILE III
The best database program is also the cheapest! Sort, select, search on any field (generic or soundex), incryption, populated fields, "smart" keys, subtotals, totals, export/import to 1-2-3, Mail-Merge, DIF, etc. Print records or mailing labels. $45 check, M/C or Visa.
ButtonWare
P.O. Box 5786
Bellevue, WA 98006
(206) 746-4296

BEAST DATA MANAGER
Define your system! Format screens the way you want them! Put your 3×5 index cards onto your PC or PCjr. The BEAST can do all this, plus give you full relational retrieval to produce reports, or files to interface with the mail merge function of your word processing software. $65. DOS 96K. Sample $5
STANTON SOFTWARE
P.O. Box 173
Stanton, NJ 08885
(201) 236-6842

MASTER MANAGER
User may tailor to any profession as a tool to organize; plan work; retrieve information. Set up your information/data files, types of work. Prepare assignment memos with time budgets and your preset completion dates; daily to-do lists; other reports you design. Step-by-step manual. Menu-driven. 64K. Write for more information. $185
MC/VISA.
MANAGEMENT SOFTWARE, INC.
Suite 316
8716½ L Street
Omaha, NE 68127

SOFTWARE DENTAL

DentalWare™
PROVEN Dental Management System—in use 4 yrs. Patient data management, A/R, statements, insurance forms, practice analysis, word processing, recall, delinquent processing, historical data. FLEXIBLE. User designed forms, notices, statements, reports. $3600. Training included. Dealer inquiries invited
DATA STRATEGIES, INC.
332 S. Juniper St., Suite 210
Escondido, CA 92025
(619) 489-9218

SOFTWARE DEVELOPMENT TOOLS

CROSS-ASSEMBLERS
Use your desktop computer as a development system with Avocet assemblers—the industry standard since 1980. Available for CP/M-80, CP/M-86, and PCDOS/MSDOS host systems, in most popular disk formats. Target chip families: 6805, 6809, 1802/05, 8048, 8051, 6502, 6800, NEC7500, F8, Z8, COP400, 8085, Z80. $200 to $500

AVOCET SYSTEMS INC.

AVOCET SYSTEMS, INC.
804-P South State St.
Dover, DE 19901
(800) 448-8500, (302) 734-0151

PASCAL AND C TOOLS
TOOLS includes full string use, screen handling, graphics, & a general BIOS gate. TOOLS2 supports all DOS 2.0 functions, including program chaining. VIEW MANAGER screens are painted with a Screen Painter & stored in the Screen Database. Source code is provided. TOOLS $125, TOOLS2 $100, VIEW MANAGER $275.
BLAISE COMPUTING, INC.
2034 Blake Street
Berkeley, CA 94704
(415) 540-5441

BASIC TRANSLATOR
Create Libraries of relocatable subprograms, access up to 5 Libraries simultaneously, and $Call modules without line numbering worries. Translator, Linker, Printer Control Facility, and Basic Lib included! Features: Logic mapping, Compression, Code Evaluation, and variable listing. FREE brochure, full package $79.
PERSONAL SOFTWARE ASSOCIATES, INC.
PO Box 206-PC
Donegal, PA 15628
(412) 423-3200

CROSS ASSEMBLERS
The same manufacturer—compatible, relocatable cross—assemblers Microtec has been providing to professional developers since 1974 are available to transform your PC/MS-DOS host microcomputer into a development system. Loaders/communication utilities included. Target families: 80186, 8096, 8085, 8051, 8048, 68000, 6809, 6800, Z80, 6500, others.

MICROTEC RESEARCH

MICROTECH RESEARCH, INC.
P.O. Box 60337
Sunnyvale, CA 94088
(408) 733-2919

P.P.E. TOOLS
Professional Programming Environment for the BASIC programmer. Structured language eliminating line #'s. Conditional macros, labeled procedures, multi-line conditionals. Reduced source file overhead. SLP Structured Language Processor—$35.00. MLP Macro/Library Processor—$20.00 ($3.00 shipping)
BENDORF ASSOCIATES
P.O. Box 5910
Roswell, NM 88201
(505) 347-5701

BASIC COMPILER POWER KIT
Give your compiled BASIC the DOS 2.0 functions interpretive BASIC has with the BASIC COMPILER POWER KIT. Over 20 subroutines let you remove, change subdirectories, search the directory, get SAT information, do string shifts & block moves, & much more. ALL in BASIC. A utility to strip line numbers from source code also included. Make the most of BASIC. $95. VISA/MC
IMRS INC.
111 High Ridge Road
Stamford, CT 06905
(203) 359-9655

SOFTWARE EDIT

KEDIT
KEDIT is an XEDIT-like full screen editor for the PC. Features include split-screen editing of multiple files, targets, ARBCHAR, SCHANGE, GETFILE, SORT, paragraph reformatting, wordwrap, block operations, & key redefinition. Needs 80 column display. 128K (160K with DOS2). $95 plus $3 shipping. Demo version $10.
MANSFIELD SOFTWARE GROUP
P.O. Box 532
Storrs, CT 06268
(203) 429-8402

BLUEBOOK

SOFTWARE EDUCATIONAL

Lessonware
No nonsense written by NY CERTIFIED TEACHERS
Lesson Control Program
(Must buy LCP once) $35
Rhyming, Grade K-2 Arlene Skagla $15
Spelling, Grade 3-6 Anne Petraglia $20
Cloze Reading, Grade 4-6 Alan Van Cott $15
Infant Ailments, Adult
Leo Di Cara, MD $15
Send check or Visa/MC number and exp date

software future, inc.

THE SOFTWARE FUTURE, INC
PO Box 60
Holbrook, NY 11741
(516) 472-1778

JENI-MATH: GRADES 1-3
Personalized package using info about your child in games, puzzles, demos, and drill exercises on · · · Written by PhD math prof for his own kids. JENI-MATH stores past performance and picks problems to maximize learning Easy to use graphics package reqs 64K, DD, color graph $30 Send for order form
JR SOFTWARE
PO Box 2848
Denton, TX 76202
(817) 383-1248

SOFTWARE ENGINEERING

TECHNICAL SOFTWARE
Largest selection of engineering software—CAD, Heat & Mass Flow, structural, Statistical Analysis and much more Microcomputer programs for Mechanical, Chemical, Civil, Electrical Engineers, Architects, Scientists, Contractors Send for detailed catalog—Include $2 00 for postage and handling
TECHNICAL SOFTWARE INC
3981 Lancaster Rd , #110
Cleveland OH 44121

ENGINEERING PROGRAMS
PSI is the foremost producer of serious engineering applications for the PC. PAKS available handle chemical, mechanical, civil and power design & analysis problems Our catalog is growing daily Call or write for your free copy. See review PC Magazine, Nov 1983, page 567
PSI/SYSTEMS
Research Park, PO Box 3100
Andover, MA 01810
(617) 475-9030

STATISTICAL QUALITY CONTROL PACKAGE
• XBAR-R charts • P-Charts • C-Charts • U-Charts • Cause and effect diagrams • Histograms • Basic statistics • Frequency distribution • PARETO Charts • Menu-driven • Tutorial • Complete documentation • Sample problems • High resolution graphics and printer output • Also available for Apple • SQC-Pack $385
CULVERIN CORPORATION
245 West Elmwood Dr
Dayton, OH 45459
(513) 435-2335 or 1 (800) 547-1565

COMPUTER-AIDED DRAFTING
AUTOCAD is 2D drafting and design enabling anyone who draws to create, edit and plot drawings AUTOCAD is general-purpose and flexible, useful for architectural and engineering drawings of all types which previously required systems costing $100,000 Dealer support includes training disk and manual for only $50
AUTODESK, INC
150 Shoreline Hwy #B20
Mill Valley CA 94941
(415) 331-0356

STRUCTURAL DESIGN
Quick, versatile, interactive structural programs—beams, columns & frames of any material efficiently analyzed & designed Extremely friendly input & output with optional COLOR graphics Specify PC configuration and send $25 for demonstration disk to
c^2b^2—software design
763 27th Avenue
San Francisco, CA 94121
(415) 751-1337

WIRE WRAPPING SOFTWARE
Save up to 90% in wire wrap prep and document time WIRELIST allows wire wrap paths to be displayed & modified interactively by user, takes named, unnamed strings from schematics, optimizes routes, checks errors; part & cross reference lists, string macros, TTL design rule checks, power consumption, & more $149.
STARBOW SOFTWARE
10403 Caminito Banyon
San Diego, CA 92131
(619) 578-4893

smARTWORK™
Printed-circuit artwork editor for double-sided boards up to 10" by 16", runs on an IBM-PC Color display allows complete interactive control over the placement and routing process 2X artwork can be made on a dot-matrix printer or pen-and-ink plotter $895 Write or call for a brochure

WINTEK

WINTEK Corporation
1801 South Street
Lafayette, IN 4704-2993
(317) 742-8428

MuMATH™-83
Infinite precision rational arithmetic plus automatic formula manipulation Includes exact integration, differentiation, limits, matrices, vector calculus, infinite series Laplace transforms and the solution of algebraic or differential equations $300 Aslo MuLISP $250.
THE SOFT WAREHOUSE
PO Box 11174
Honolulu, HI 96828-0174

SOFTWARE FILE MANAGEMENT

KWIC-REF/1
A general purpose text filing system It is designed to file and cross reference documents, notes, letters and any text materials It can keep track of up to 32,000 key words and 32,000 documents using "and" "or" and "xor" combinations $300
CHEN INFORMATION SYSTEMS, INC
1499 Bayshore Blvd, Suite 205
Burlingame, CA 94010
(415) 692-4358

SOFTWARE FINANCIAL

ENCORE™ DECISION SUPPORT
ENCORE is the most comprehensive business modeling, analysis, planning, reporting, and graphics decision support system available. ENCORE combines the popular features of an interactive spreadsheet with the extended capabilities of a business planning language, consolidations, goal seeking, formal reporting, financial functions, business graphics and much more Send for 32 page brochure
FEROX MICROSYSTEMS
1701 N. Fort Myer Dr /6th Floor
Arlington, VA 22209
(703) 841-0800

CASH FLOW MANAGEMENT
LOOK takes all the what-if power of LOTUS 1-2-3™ and allows the executive to solve problems without programming his computer It is menu driven and generates common-sized financial statements, ratios, cash flow, trend reports and graphs Tactical and strategic planning is the focus of LOOK Dollar and or percentage variables are changed to generate proformas for 5 years or 12 months $950
BAKER HILL & COMPANY
9085 E Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

LAW OF ECONOMIC JUSTICE
A totally new economic concept based on logic and/or mathematics and the existing laws of physics which provides irrefutable solutions to the problems of unemployment, the welfare mess and foreign trade All color graphics $100—30 day full refund—if GIGO—or $25 + your evaluation, but no refund
ROBERT S VIERRA
2229 Woodside Lane #2
Sacramento, CA 95825
(916) 927-6476

SOFTWARE GAMES

cheapware™
Compute exact odds for any Poker hand and play DRAW POKER on your PC, XT or PCjr. Play for points to beat your highest scores, play against the dealer for most wins, play against up to 6 others for fun or money Requires color adapter & RGB monitor Price-DOS 1 1 $17 75 DOS 2 0/2 1 $22 25 MO res add 5%% tax
ROBERT L NICOLAI
4038 N Ninth St
St Louis, MO 63147

SIEGE OF PLANET HOUSTON
FIGHT YOUR WAY back to planet Houston defeating & capturing perimeter forts beginning with the farthest outpost at the Galactic rim. Success depends on reaching the center of command behind the last line of defense But don't take too long! Time works against your attack plan PCDOS, color/graphics adaptor, 64K, $25 25
BAINUM DUNBAR
6427 Hillcroft, Suite 133
Houston, TX 77081
(713) 988-0887

CHECKERS
15 mos R&D & field testing has produced first class checkers game Easy-to-learn, easy-to-play, yet loaded with menus, 30 skill levels, prompts, features/variations, great graphics! FUN FOR THE WHOLE FAMILY! Children can play, yet challenges adults, even at 10 secs/move! 96K/DOS/color 10 day money back guar! $35
GRAMPS THE CHECKERS CHAMPION
OAKCREST SOFTWARE
PO Box 337
Zionsville, IN 46077

BACKGAMMON
Our popular Backgam 1™ lets you challenge the computer to a great game of backgammon whether beginner or advanced Game allows for several different levels of ability Improve skills or just have fun. For IBM PC, XT, Compaq or compatible Send $39 95 Check, MO, VISA/MC or call for dealer near you. Requires 64K, any version DOS, 80 col monochrome or color disp
Sears Electronics Inc
Tirrell Hill
Goffstown, NH 03045
(603) 497-3074

SOFTWARE GENERAL

BAR CODE GENERATION SW
Create BAR CODE labels with Old 84, 92, 93, Epson X Trilog printers. Interactive pack. Prints 39, 93, 12 of 5, 2 of 5, Codabar & UPC-A symbologies on 1-3 up label stock Inc./Dec OCR interpretation—meets LOGMARS reqmts CPM-86, PCDOS—for IBM PC/XT, COP MPC, other compatibles $300 Dealer pricing available
DATAFLOW TECHNOLOGIES, INC
8422 Bellona La., Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

PRINTER BASHER™
Get full menu-based operation of ALL control functions of ALL of the Epson MX, FX and RX printers with the PRINTER BASHER™. Also downloads to the FX the three COMPLETE 255-character IBM sets, including block and line graphics, greek symbols, etc Scores of different print styles, and a few keystrokes does it all. For the IBM-PC, Apple IIe and Epson QX-10 computers Visa, MC, COD $59 95 Free info. Dealers welcome

PRINTER Basher™

CONNECTICUT SOFTWARE
30 Wilson Avenue
Rowayton, CT 06853
203-838-1844

PROGRAM RESIDENCY MANAGER
Load your PC's Memory with any combination of programs with Res. Then instantly execute any of them by pressing a function key. Configure Res. to automatically load programs. Imagine a compiler editor and linker loaded at the same time, each instantly run with the press of a function key $60 IBM PC or TI PRO
DYNAMITE SOFTWARE
PO Box 181147
Austin, TX 78718-1147
(512) 452-5475

YOU NEED NEVER MISS
Another important date The program can be initiated by AUTOEXEC BAT (or run separately) to search your "custom" calendar and display current items each time the system is booted. The program permits adds, deletes, and changes to the calendar file MEM--JOG " is value packed. Req 1-Disk $24 95
DAFER ENTERPRISES
PO Box 2336
Baltimore, MD 21203
(301) 433-3904

COMPU-CHEF CULINARY GUIDE
A complete culinary guide for the PC & PC compatibles A must for the chef in every home. Create your own library of recipes or use the recipes included in the system Perform portion control, create a shopping list, access files for culinary terms & more. Complete tutorial & documentation included Req 128K, DOS, 1 or 2 DS/DD drives $30 Dealers welcome
DEAMICIS SOFTWARE DEVELOPMENT
4193 Galbar St.
Oceanside, CA 92056
(619) 758-4766

PC. DATEBOOK/CALENDAR
Full featured Personal DATEBOOK CALENDAR & ADDRESS LIST organizes your hectic family or business schedule Display & prints monthly calendar with daily events and appointments Maintains, searches and displays your address list too! Fast and easy to use. Only $29 95 Prompt shipment VISA, MASTER, check or COD
LATERAL PROGRAMMING, INCORPORATED
Altamonte Springs
Florida 32701-0337
(305) 768-1433

FSI CALCULATOR $49.95
Get more use from your computer! The FSI CALCULATOR provides a full featured business and scientific calculator on your PC Develop your own functions (save to disk) and use the 35 built in functions Eight accumulators, function keys, tape feature and more! Requires DOS, 128K Shipped UPS MC, VISA
FUNCTIONAL SOFTWARE INC.
PC Box 237
St Clair Shores, MI 48080
Order now! (800) 824-7888 Operator 168

PUBLIC DOMAIN SOFTWARE
Our Users Group Library can help you get more from your PC or PCjr! Choose from these software packages
- NEW PC or PCjr USER-3-disc starter set $25
- PC SIX-PAC-Six discs containing a wide variety of useful software $49
- SAMPLER-one get-acquainted disk $10

Send in your order today (please include $2 for shipping & handling) Catalog included
CENTRAL CALIFORNIA USERS GROUP
PO Box 8140
Santa Cruz, CA 95061
(408) 684-1617

LARGO SOFT INTERNATIONAL
ARGOSPACK	-The industrial/mechanical engineering pack
HIGHCAD	-The complete highway & construction CAD system
THERMAX	-The printed circuits board heat transfer CAD system for Mil-specs designers
IDP	-The complete 2½ D drafting system
STARNET	-The powerful project management system
PC-MAPICS	-Systems 34 IBM mapics compatible See us at COMDEX—Booth #6643

LARGO SOFT INTERNATIONAL
1 Hameas'im Street
Tel Aviv Israel 64736
03-250918/250919 Telex 35301 LARGO IL

DVORAK KEYBOAD SOFTWARE
Want a Dvorak Keyboard for your IBM PC? SureStroke translates keystrokes; gives you Dvorak Typing Coach, transfer letters for key tops, manual, self-motivation audio cassette Works with Lotus, dBase, WordStar, etc. Stop hunting and pecking—Stroke the Dvorak today! $49 95 plus $3 95 shipping. Visa/MC or check
SEASONED SYSTEMS, INC
Box 3036
Chapel Hill, NC 27515
(800) 334-5531 (919) 967-5818

BARGAIN SOFTWARE PACKAGE
An information filer, a complete address book system with many features, a text encoder, a biorhythm calculator, a banner program, several games and much more. For IBM—PC/XT Requires 1 disk drive PC—DOS 2 0/2 1 User friendly Only $29 50 - $1 50 shipping CT residents please add 7 5% sales tax
LK SOFTWARE
5 Hooker Lane
Cos Cob CT 06807
(203) 869-6707

SOFTWARE GRAPHICS

35mm SLIDE FROM YOUR PC
COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into brilliant 35mm color slides with color resolution 400% better than your monitor Leave your printouts behind Use high resolution color slides at your next presentation COMPUTER SLIDE EXPRESS $6/slide $30 minimum order
VISUAL HORIZONS
180 Metro Park
Rochester, NY 14623
(716) 424-5300

GRAPHWRITER PRESENTATION GRAPHICS
Graphwriter™ is specifically designed for your presentation graphics requirements Chart formats include pie, bar, line, text, scatter, organization, GANTT, "bubble", table and many other special purpose chart formats With Graphwriter you get the chart you want, the way you want it Starting at $395
GRAPHIC COMMUNICATIONS, INC
200 Fifth Ave
Waltham MA 02254
(617) 890-8778

HALO™
Graphics subroutines that run under MS/DOS in PASCAL, C, ASSEMBLER FORTRAN, BASIC, and APL - Supports color & monochrome graphics devices & can be graphics interface to applications Lines, arcs, circles, dithering, patterns, etc can be created World coordinates, fonts, image compression & animation features Inc
MEDIA CYBERNETICS, INC
36 Columbia Ave
Takoma Park, MD 20912
(301) 270-2272

FORTRAN GRAPHICS PACK
60 MicroSoft FORTRAN/PASCAL (1 0 or 3.1) or SuperSoft FORTRAN callable subroutines Professional graphics power backed by a 90 page user manual, filled with examples and designed to be useful to every level of user Five packages in one! General utility, 2-D interactive, 2-D plots, 3-D plots, and solid models (hidden line removal!) $135 00
MICROCOMPATIBLES
11443 Oak Leaf Drive
Silver Spring, MD 20901
(301) 593-0683

GRAPHIC PRINTER SUPPORT
At last IBM-PC graphic character support for your dot matrix printer Use the PrtSc key to produce quality scaled dot matrix reproductions of your display on your Epson, IBM, Okidata, IDS, Centronics DEC, Anadex Datasouth, Gemini, TI 850 Riteman, Toshiba, NEC 8023, or C. Itoh printers If your printer is not listed, let us know and we will support it GRAFPLUS is now available for all versions of PC or MS-DOS and will operate with IBM and Hercules graphics boards as well as the IBM monochrome $49 95
JEWELL ENERGY TECHNOLOGY
4451-53rd Avenue Southwest
Seattle, Washington 98116
(206) 937-1081, (214) 245-7387

PLOTOGRAPHY™
Now PLOT your graphics drawings on paper or transparency Great for ovrhd presentations Make them any size, anywhere on page, either direction Will PLOT drwngs from most graphic editors Reg IBM PC, XT or PCjr, 128k, clrbrd, flpy or hrddsk, PC DOS Only $49 95! Call to see if we support your plotter
CACTUS SOFTWARE, INC
PO Box 880
Peoria, AZ 85345

COLOGRAPHY™
Color graphics editor for IBM PC & XT Lets you create color images on the screen with ease Can be used by anyone for Business, Education, Programming, Design & Art Your next SW update is FREE! Requires IBM PC or XT, 128k, color board, 1 flpy or hrd dsk, PC DOS Only $99.95! Call or write for more details
CACTUS SOFTWARE, INC
PO Box 880
Peoria AZ 85345
(602) 242-7953

FORTRAN/PASCAL PEN PLOTS
PLOTMATIC Complete support for H-P, IBM, Apple and HI pen plotters All primitives available as subroutine/procedure calls PLUS total 2D plotting support package Interfaces with GRAFMATIC Specify compiler (version number) and plotter $135 Plotmatic from Microcompatibles
Microcompatibles, Dept P
11443 Oak Leaf Dr
Silver Spring, MD 20901
(301) 593-0683

BLUEBOOK

SOFTWARE HOBBIES

ATTENTION: COIN COLLECTORS
Unique program records entire coin collection and produces various reports that serve for personal investment information. Built-in market value file provides latest prices for 1600 U.S. coins. Requires 64K/2 drives/printer. COINS software & manual $95. VISA/MC OK. Quarterly COINS value updates $25.
COMPUQUOTE
6914 Berquist Ave. Dept. PC
Canoga, CA 91307
(818) 348-3662

ASTROLOGY SOFTWARE
We have everything from high-accuracy calculation packages for professional astrologers to programs that print multipage natal, forecast, relationship and numerology interpretations for everyone. These interpretation programs include a license to sell the copyrighted text output.
AGS SOFTWARE
BOX 28, Dept. C
Orleans, MA 02653
(617) 255-0510

STAMP COLLECTORS
The Philatelic Management System is superior software for every level of collector. Covers every aspect of collection management. Inventory Module now available and upgradeable to complete system. IBM PC, Apple IIe and III. Complete system $295, Inventory Module $159. Demo package $15, credited to final purchase.
SOFTSTYLE, INC.
7192 Kalanianaole Hwy., Suite 205
Honolulu, HI 96825
1-(800) 396-6368

SOFTWARE INSURANCE

THE AGENCY MANAGER™
Designed by insurance professionals for independent insurance agents, this integrated system performs: Customer acctg., general ledger, client data update and retrieval, over 100 marketing reports and sales tools, ACORD's. Easy main menu and HELP feature. IVANS. IBM-PC, CP/M, Turbodos.
APPLIED SYSTEMS
Pauling Rd.
Monee, IL 60449
(312) 534-5575

PROPERTY/CASUALTY INSURANCE
Insurance agency automation package. Completely interactive from invoicing to P&L statements. Provides CR, CD, JE month end summaries, daily transaction reports. Basic pkg-$1500. Other options available including on-line customer policy retrieval profile, customer on-line daily transactions, producer reports, & more.
PC-DOS & CP/M
Dimensional Business Systems, Inc.
250 N.W. 4th Diagonal
Boca Raton, FL 33432
(305) 368-0270
199 Bay St., 4th FL
Toronto, Ontario, Canada M5J1L4
(416) 367-9882

SOFTWARE LANGUAGES

FORTH-32
The most complete language available for the PC. Comprehensive 420 page manual. Complete interface to DOS and BIOS, including graphics, video interface, parallel and serial ports, light pen, joy-stick, sound, color, DOS file access. Double screen editor. The only full FORTH 8088 Assembler. See our ad this issue.
QUEST RESEARCH, INC.
303 Williams Ave.
Huntsville, AL 35801
(800) 558-8088 or (205) 533-9405

PROFESSIONAL BASIC
A new version of BASIC language that can access the full memory of the IBM PC supports the 8087 co-processor. Professional BASIC is a window oriented system of more than a dozen trace screens for debugging and educational purposes. Dynamic syntax checking labeled GO/SUBS cross-ref & set break pts. $345
MORGAN COMPUTING CO., INC.
10400 N. Central Expwy., Suite 210
Dallas, TX 75231
(214) 739-5895

SOFTWARE LEGAL

LAWSEARCH-WESTLAW
Access the WESTLAW legal database using an IBM PC/PC-XT or compatible. Certified and recommended by West Publishing Co. for their WESTLAW subscribers using PCs. Easy to learn & use. Log-on automatically w/one keystroke. Save information to disk or printer. Convert files for use with most wordprocessors. $350.

direct-aid
DIRECT AID, INC.
PO Box 4420
Boulder, CO 80306
(303) 442-8080

SOFTWARE MAILING PROGRAM

MY — T — MAILER
This menu-driven mailing program will print labels, 3-5 cards, envelopes, etc. all sizes, all arrangements! Sort on all fields. Powerful commands select labels in any order and up to 5000 copies of one label can be printed. Supports RAM disks and Hard disks. Requires 128K, DOS, parallel printer, 80 col display. $30
JOHNSON SOFTWARE COMPANY
Suite 195
420 Pier Avenue
Hermosa Beach, CA 90254

INNERVISION'S MAILER
A database of names, addresses, and many other vital statistics make a powerful mailing system for your PC/XT/jr. The program is menu-driven. It prints mailing labels, form letters, telephone directories, and master listings. Functions include full screen editing, 19 way query with ADD & SUBSET, 17 way sorting, dynamic printer control, and printout formatting. Req. 1 dd, 128K, DOS. $60 + $4 shipping.
INNERVISION MICROSYSTEMS, INC.
P.O. Box 3427
Silver Spring, MD 20901
(301) 445-2493

SOFTWARE MANUFACTURING

QUALITY CONTROL
QUALITY ALERT™—Diagnose and correct quality problems with ease. Descriptive statistics • Histograms • Control Charts • Process Capability • Variable/Attribute Data Samples • Graphic and Printer Output • User Friendly • Menudriven • Complete Documentation • Support • Apple, IBM PC & XT compatible. Money back guarantee. $795.00
PENTON SOFTWARE, INC.
420 Lexington Ave. /Suite 2846
NY, NY 10017
(212) 878-9600, 1-(800) 221-3414

MCBA MANUFACTURING SYSTEM
Adapted for the IBM PC using MS-DOS. Inventory Management, Bill of Materials, Order Processing, Purchasing, Job Costing, MRP, Labor Performance, Shop Floor Control, Standard Product, Costing and Routing, Accounting. Install & support available. In use at over 11,000 installations!!!
MDM Systems, Inc.
5701 Chicago Rd., Suite C
Warren, MI 48092
(313) 979-7030

MYTE MYKE™ MANUFACTURING
CONTROL SYSTEM integrates with BUSINESS SYST & features mainframe capabilities. STD COST — bill of matl and operations routing provide where used, same as except, & projection capabilities. FORECAST/SCHED, MRP, MPP, Production costing, SHOP FLOOR CTRL. Install & support avail CP/M, PC DOS, MS DOS, UNIX & more.

MYTE MYKE
POWERFUL MICROCOMPUTER SOFTWARE

MDS ASSOCIATES, INC.
PO Box 108
Orchard Park, NY 14127
(716) 662-6621

TWIN OAKS MRP-II
- Bills/material
- Inv Control
- Purchasing
- MRP & CRP
- Master Sched'g
- Phys inventory
- Std Costing
- 22 Modules
- 128K PC or XT
- DOS 1.1 or 2.0
- Hard/Soft Disk
- Online—Realtime
- Multi User
- Acctg Interface

TWIN OAKS, INC.
8130 East Pt. Douglas Rd.
Cottage Grove, MN 55016
(612) 458-1604

MANUFACTURING INVENTORY
Designed with the small- to medium-sized manufacturing firm in mind, MISys is big enough to handle your needs, yet costs only $995. Integrated Inventory Control, Bills of Material, Purchase Orders. For IBM PC/XT and compatibles. Multi-user versions also available. Dealer inquiries invited.
MICROCOMPUTER SPECIALISTS, INC.
18 Lyman Street
Westboro, MA 01581
(617) 366-1200/(800) 833-1500

SOFTWARE MEDICAL

POS/1™ VERSION 4.0
MEDICAL BILLING & A/R. Statements & Ins. forms. Aging & revenue analysis with bar graphs. Multiple doctors, practices, insurances. Day sheets, recall notices, referring physicians, audit trails, ledger details. Online update & access by acct #/name. Customizable procedure & Dx codes, menu-driven, help screens. PC-DOS, 128Kb, hard disk. $2200
CHEN INFORMATION SYSTEMS, INC.
1499 Bayshore Hwy. Suite 205
Burlingame, CA 94010
(415) 692-4358

BLUEBOOK

CompuMedic™
PROVEN Medical Management System—in use 3 yrs. Patient data management, A/R, statements, insurance forms, practice analysis, word processing. Options—Split Aging By Doctor, Laboratory, Canadian, Industrial medicine, electronic claim processing. Training included. XT $3600. Dealer inquiries invited.
DATA STRATEGIES, INC
332 S. Juniper St., Suite 210
Escondido, CA 92025
(619) 489-9218

LITERATURE FILING SYSTEM
SearchLit Version 2.0 stores and searches bibliographic data for your literature collection. Retrieval based on title, author, source, abstract or key word index. Absolutely NO programming required. Will merge downloaded data. Sorted output. Source code & file structure provided. DOS 1.1, 2.0. $249.50. Demo disk $10.
MediSoft
1595 Soquel Dr., Suite 350
Santa Cruz, CA 95065
(408) 476-7106

FREE DEMO DISKETTE!
Turn your computer into a valuable ally in achieving perfect fitness and permanent weight control. Order demo diskette for only $6.00 and deduct this from the purchase price of $69.95 when ordering the Master Control Diet and Exercise Program. PCjr version now available (128k, 80 column monitor).



HEALTHWARE
1504 Leander Rd.
Georgetown, TX 78626
(512) 863-6910

DIFFERENTIAL DIAGNOSIS
The INTERNIST program runs differential diagnoses on any combination of 480 symptoms for 331 diseases. Lists symptoms associated with any disease. Prints and displays diagnoses in rank order. Extremely easy to use and fast. Includes binder, user-manual, program and data base diskettes. $95.00. VISA, MC, check, or UPS COD accepted.
N-Squared Computing
5318 Forest Ridge Rd.
Silverton, OR 97381
(503) 873-5906

SOFTWARE
OPERATING SYSTEMS

MULTI-USER XT SOLUTION
With OASIS-16 operating system, run 3 users on an IBM PC XT using all IBM components. Each user may run different programs, or files can be accessed simultaneously by all users with security & data integrity. Share printers. Run proven basis business applications and/or develop your own BASIC programs. $795.
PHASE ONE SYSTEMS, INC.
7700 Edgewater Dr., Ste. 830
Oakland, CA 94621
(415) 562-8085, TWX 910-366-7139

MULTIPLE USERS UNDER PC DOS
MultiLink turns PC-DOS into an efficient multi-user multi-tasking operating system. Additional users are supported by attaching inexpensive CRT terminals or modems to serial ports on the PC, and can run normal applications designed for PC-DOS. Includes host communications software for public dial-in.
THE SOFTWARE LINK INCORPORATED
6700 238 Roswell Rd.
Atlanta, GA 30328
(404) 255-1254

TASCMASTER SOFTWARE
Multi-Tasking IBM-PC or IBM-PC-XT. Operating under PC-DOS, allows up to 9 tasks to be run concurrently in background mode unattended. Can work in Wordstar, do a calculation from Lotus 1-2-3, monitor modem, database sort and month-end closing from Accounting Program all at once. Price $475 including Addram Plus or Addram Elite multifunction board.
PROFIT SYSTEMS, INC.
30150 Telegraph Road
Birmingham, MI 48010
(313) 647-5010

SOFTWARE
PREVENTIVE MAINTENANCE

DISKETTE DRIVE ALIGNMENT
READISCOPE is a comprehensive diagnostic program that analyses the status of a diskette drive. Fast, 1 minute checkout. Drives can be tested without removal. Adjustments to head, speed and spindle hub alignment can be made without special tools or skills. Comes complete with special diagnostic disk, $298.
ReadiWare Systems, Inc.
P.O. Box 680-N
West Redding, CT 06896
(203) 431-3521

SOFTWARE
REAL ESTATE

PROPERTY MANAGEMENT PLUS
A new easy-to-use system for single or multi-family properties. Prints checks, rent statements and receipts. Reports—late rents, expired leases, vacancies, income/expenses, and operating statements. Includes a bank reconciliation feature and graphics capabilities!! Up to 70% reduction in management time. $525.
REALTY SOFTWARE COMPANY
1926 South Pacific Coast Hwy, #229
Redondo Beach, CA 90277
(213) 372-9419

REAL ESTATE TOOLS I
Over 45 powerful, easy-to-use, menu-driven analyses of mortgages (regular, ballon, GPM, constant principal, wrap), leases, construct. Loans and variable/grouped cash flows plus amortizations. Computes IRR, NPV, FMRR, price, points, yield, etc. For IBM PC/XT/compatibles, 128K, 2 DS drives. 228-page manual. $299.
ANSONN SOFTWARE INC.
2801 N. Surrey Drive
Carrollton, Texas 75006
(214) 446-4340

SUPER EASY-"REALPAC"
Professional Investment Analysis in minutes, without computer training. Full screen editing. Calculates Incomes, Cash Flows, IRR's & Depreciation, tax shelter and MORE. Prints very easy-to-read reports. Also included are easy, but sophisticated Amort. Sched.'s, IRR & Depr. Calculators. FULL Manual—Price: $275
CREATIVE BUSINESS COMPUTER SYSTEMS, INC
6731 Red Road
Coral Gables, FL 33143
(305) 666-7970

EZ-RE INVESTOR TEMPLATES
Complete analysis package for the Real Estate Investor. For Equity Share, Rent House, Apartments, Warehouses, and Office Buildings. Five mortgages can be ARM, FHA245, amort, deferred int. or int only. Ten year projection of cash flow, deductions, sell price, tax at sell, gain or loss per year, and after tax IRR. Expenses, int, rent, and appreciation adjust annually. Also 45 year loan amortization template. Prof report. Requires LOTUS 123 and 256K. $50 PPD. Money back guarantee. Visa, MC.
LB ASSOCIATES, INC.
8817 Skoke Lane
Vienna, VA 22180
(703) 938-9093

SOFTWARE
SECURITY

BIT-LOCK® SECURITY
Guard your valuable software from PIRACY. Our inexpensive security system protects you from lost profits. Copies will only operate with a BIT-LOCK device attached. BIT-LOCK's powerful multi-layered security has proven its effectiveness on IBM PC/XT, TRS-80, Apple and commodore computers thru the test of time.
MICROCOMPUTER APPLICATIONS
7805 So. Windermere Circle
Littleton, CO 80120
(303) 922-6410

PUBLIC KEY ENCRYPTION
The ultimate security for your data, on disk or during transmission. Datamorphics' Public Key Encryption system permits you to choose your level of security; eliminates the key security problems of point to point encryption schemes. Ideal for business to business or business to government communication. List Price: $199.00 (Canada $249.00)
DATAMORPHICS LTD.
P.O. Box 820, Stittsville,
Ontario, Canada K0A 3G0
(613) 836-3270

SOFTWARE
SERVICES

APPLE™ VISICALC™ TO 1-2-3™
Apple II (+ and e)™ Visicalc™ diskettes converted to IBM™ Lotus 1-2-3™ diskettes. NO MODEMS, NO FUSS, MONEY BACK GUARANTEE. 5 CENTS PER ENTRY CONVERTED—$75 MINIMUM FEE. Don't pay for complex conversion schemes until you try this easy method. Carefully pack Apple II diskette(s) and mail with check to
R.J. PRODUCTS
P.O. Box 18410
Irvine, California 92713-8410

SOFTWARE
SORT

OPT-TECH SORT/MERGE
Extremely fast Sort/Merge program for the IBM-PC. Can sort or merge multiple files containing fixed or variable length records. Run as a DOS command or call as a subroutine, plus many other features. Now also sorts dBASE II files! Compare before you buy any other. Write or call for more info. $99
OPT-TECH DATA PROCESSING
P.O. Box 2167
Humble, TX 77347
(713) 454-7428

BLUEBOOK

PERSONAL COMPUTER SORT
Fast, easy-to-use sort program for your IBM PC. Can sort your text files on multiple fields in either ascending or descending order. Handles fixed or variable length records. Clear concise messages make it easy to understand and operate. $50.
ThoughtSoft
PO Box 3112
Cincinnati, OH 45201
(513) 221-7539

INTERNAL SORT FOR BASIC
N SORT—A FAST and easy to use quicksort subroutine written in C and assembler, CALL able from BASIC. Sorts an unlimited number of records in memory on up to 8 keys of mixed types, ascending/descending. Like having a SORT built into the language. Works with compiled and interpreted BASIC, all DOS versions. $49.95!
NATIONAL SOFTWORKS
65 East Elizabeth Avenue
Bethlehem, PA 18018
(215) 867-4800

SOFTWARE
STATISTICS

SIGSTAT
SIGSTAT includes over 30 programs of the BMD statistical series, plus many advanced new features. Mainframe capacity (up to 80 var.) for uni—(e.g., ANOVA, regression) + multivariate (e.g., canonical, factor) analyses, time-series, crosstab, plots, and much more. 8087 support opt. 128K, DOS, $325.
SIGNIFICANT STATISTICS
3336 N. Canyon Road
Provo, UT 84604
(801) 377-4860

THE SURVEY SYSTEM
An easy to use, menu driven system for the entry, editing, processing and presentation of questionnaire data. The system can produce crosstabs and scores in banner format, statistics and bar charts. Tables and charts are camera-ready for professional presentations. Card readers and open-end coding/analysis options available.
CREATIVE RESEARCH SYSTEMS
1864 Larkin Street, #2
San Francisco, CA 94109
(415) 771-0912

NWA STATPAK
Powerful data manipulation utilities, ASCII data structure for interface to databases, word processors, etc. Statistical functions include probability, descriptive statistics, regression and correlation, non-parametrics, distribution functions, means testing, survey data analysis, & ANOVA $495.
NORTHWEST ANALYTICAL, INC.
1532 Morrison St.
Portland, OR 97205
(503) 224-7727

MSUSTAT
40 procedures—Multiple regression, analysis of variance & covariance, multiple & contrast comparisons, non-parametrics, attribute data analysis, t-test, random data generation. Simplicity, but with features for professionals. A fast compiled FORTRAN ready-to-run package for MS/PC-DOS with 128K & CP/M-80. With 64K ($505).
THE RESEARCH AND DEVELOPMENT INSTITUTE, INC.
Montana State Univ. Attn: R.E. Lund
Bozeman, MT 59717-0002
(406) 994-3271

SOFTWARE
STOCK ANALYSIS

STOCK MANAGER
A sophisticated system that offers you an easy & economical way to keep your investment portfolio current. Keeps over 25 items of information on over 400 stocks. Produces several reports including current value of the portfolio. Easy to follow menu. $150. Send or call for our complete catalogue
OMNI SOFTWARE SYSTEMS, INC.
146 North Broad Street
Griffith, IN 46319
(219) 924-3522

WALL STREET WINDOW
- integrated stock pkg with extensive TECHNICAL ANALYSIS–moving augs., stock comparisons, trendlines, relative strengths & more.
- Detail hi-res GRAPHS, avail. in four COLORS using COLORPLUS board.
- SPREADSHEET interface for portfolio updating.
- AUTOMATIC access to DOW JONES, historical & current quotes.
- AUTORUN using saved keystrokes, $395, DEMO-avail.

R&D SOFTWARE ASSOCIATES
PO Box 2727
Reston, VA 22090
(703) 476-6597, 950-1088 (pause) 800-123

BRANDON STOCK SYSTEM
Full feature technical analysis system for PC & compatibles. Use the built-in buy/sell formula for the single keystroke graphing functions. Support hard disk, Tymnet, Telenet, Uninet, Dow Jones (for updating), The Source, Compuserve. Full color, very fast high & medium res. graphics. Requires 128K, 2 DS/DD drives, Hayes compatible modem. Price $325 VISA/MC.
BRANDON INFORMATION MANAGEMENT
615-N 666 W. Germantown Pike
Plymouth Meeting, PA 19462
(215) 828-3249

SOFTWARE
TAXES

PARTNERSHIP TAX ANALYSIS
Unique partnership tax planning and analysis program. Save millions for your own or your client's partnership. Program menus allow the evaluation of all planned partnership action for the implication. System gives you alternative and backs each one up with court decisions, rulings, regs and opinions. Stand-alone, Runtime™ $2,495
STRAG ANALYTICAL SYSTEMS, INC.
P.O. Box 42625 Suite 350
Houston, TX 77242
(800) 835-2246 ext. 99. In Kansas (800) 362-2421 ext. 99.

SOFTWARE
TERMINAL EMULATION

BURROUGHS HANDSHAKE
AN ALL-SOFTWARE Burroughs MT9 83/TD 830 terminal emulator. HANDSHAKE allows PC or compatible microcomputer to communicate with existing Burroughs host programs. Also transfers files between the host and microcomputer disk storage concurrent with dialogue. Installed worldwide.
SOFTWARE CLEARING HOUSE
771 Neeb Road
Cincinnati, OH 45238
(513) 451-6742 Telex 24-1665

BLUE LYNX
Let your IBM/PC or XT replace your dumb terminals. The BLUE LYNX hardware board with associated software emulates the 5251/12 for the S/34, S/36, & S/38 as well as the 3276 for the larger 43XX and 30XX mainframes, both bisync and SDLC versions. TECHLAND specializes in communications. BLUE LYNX is only $690.
TECHLAND SYSTEMS INC.
25 Waterside Plaza
New York, NY 10010
(212) 684-7788

SOFTWARE
TRAINING

THE AUTHOR® & AUTHOR PLUS
THE AUTHOR™ is a flexible, reliable, COMPUTER AUTHORING SYSTEM. Its ease of use, automatic branching, complete record keeping & thorough documentation make it a proven winner. THE AUTHOR PLUS™ combines all of these features with GRAPHICS, expanded use of function keys, and full screen editing & entry.
PHOENIX PERFORMANCE SYSTEMS, INC.
324 South Main Street
Stillwater, MN 55082
(612) 430-2980

INFOSTAR TUTORIALS
Two interactive tutorials on DATASTAR and REPORTSTAR. All principal procedures are explained, including the use of keyfields, resorting data files, and using logical expressions. Each tutorial includes a two-disk training program and 50-page handbook with exercises and sample applications. $59.95 ea.
WITECH CORPORATION
763 Vallejo Way
Sacramento, CA 95818
(916) 441-7772

SOFTWARE
TRANSPORTATION

FLEET ROUTING SOFTWARE
TRUCKSTOPS™ optimizes truck loading, stop sequencing, fleet size. Considers vehicle size & type, stop locations, times & quantities, time constraints, backhauls. For a small fleet to as many as 500 and up to 2,000 stops. Runs on IBM PC, S/34, S/38, Apple II, IIe, III and TRS 80. Demonstration disk available at $45.



MICRO ANALYTICS, INC.
Dept. U
8409 Hunt Valley Drive
Vienna, VA 22180
(703) 281-8730

SOFTWARE
TYPESETTING

HIGH-TECH TYPESETTING
Our fully automated facility allows us to offer the fastest turnaround time and lowest prices. Transmissions received by 1:00 pm EST are sent out the same day. Cost is a low $2/thousand characters with a $5 minimum per job. Transmit toll free 24 hours/day. 200 typestyles available including "printout." Hyphenation & justification program available for PC—$50. Major credit cards accepted. Call for free brochure. Comprehensive manual available $10.
INTERGRAPHICS, INC.
106 A South Columbus Street
Alexandria, VA 22314
(800) 368-3342, (703) 683-9414 in D.C. area

BLUEBOOK

SOFTWARE UTILITIES

SYMBOLIC DEBUGGING

The Mylstar SD Program enhances the IBM DEBUG Program using the same command structure. Use symbol names, mathematical expressions, Batch Files, on-line help, multi-command macros, anc loop structures. Makes your job easier, for PC-DOS 1.1 128K RAM minimum. $125.00 check, money order, MC or VISA.
MYLSTAR ELECTRONICS, INC.
165 West Lake Street
North Lake, IL 60164
(312) 562-7400

FULL CONTROL FROM BASIC!

Cut development time, add speed & power to your programs with NLIB. A library of assembly language sub-routines callable from BASIC, execute COM & EXE files, save & restore areas of the screen, clear & scroll windows, much more! Add DOS functions to your menus. Create fast help screens. Unlimited uses. Complete manual & sample programs. All DOS versions. $49.95. Source avail. Call or write.
NATIONAL SOFTWORKS
65 East Elizabeth Ave
Bethlehem, PA 18018
(215) 867-4800

COPY PROTECTION BY MSD

The ULTIMATE diskette copy protection system designed for software developers and publishers. A variety of protection methods are available to suit your protection requirements. All IBM PC and XT environments are supported which includes DOS, BASIC (compiled and interpretive) Pascal, P-System, dBASE II and stand-alone systems. Customized systems also available. Requires 64K, two disk drives.

MSD

MICRO-SOFTWARE DEVELOPERS, INC.
214¼ West Main Street
St. Charles, Illinois 60174
(312) 377-5151

KNOW THY PC!

- THE INSIDE TRACK gives your programs speed and control. Read files as fast as DOS, display data faster, load programs faster, control memory use, run any program from your program, copy-protect your disks, and much more. Fold-out memory map too! Disk (61 programs) & manual $45
- The popular PEEKS 'N' POKES shows you how to access and modify the status of the PC. Perform DOS and BIOS function calls from BASIC or Pascal! Learn how to find more Peeks 'N' Pokes and much more. Disk (58 programs) & manual $30. Shipping—$2.50/order. MC/VISA.

DATA BASE DECISIONS
14 Bonnie Lane
Atlanta, GA 30328
(404) 256-3860

BASICWINDOW

Screen Generator and Processor for BASIC programmers. This package combines a Screen Painter for creating and modifying screens and Macro Language and Compiler for quicker coding and testing. Features COLOR, field variables, complete input editing, line drawing. For BASIC, BASICA, and BASIC Compiler users. Includes manual and reference card. $99.95 VISA/MC accepted.

BasicWindow™

G. FREEMAN & COMPANY, INC.
15 Albin Road
Stamford, CT 06902
(203) 327-9868

THE SCREEN GENERATOR v 3.0

If you can't display a FULL COLOR data entry screen with up to 200 values and process it for Add, Update, Delete or Inquiry in LESS THAN TEN Basic or Assembler statements, then YOU need the NEW SCREEN GENERATOR v 3.0. Total screen management and data entry processing for the Novice to the Professional. $125.
K•S SYSTEMS
P.O. Box 643
Drexel Hill, PA 19026
(215) 449-2754

DISK EMULATION

Read, format and write over 40 disk formats on your PC w/FILETRAN II. Runs on most IBM compatibles w/PC/MSDOS. Allows compatibility with ~40 micros. Disk utility also available with sophisticated data recovery to edit above formats. These programs are a *must*—call for special low offer.
BUSINESS MICRO PRODUCTS, INC.
3128 Hager Lane, Unit B
Glenwood Springs, CO 81601
(303) 945-8166

SYMBOLIC DEBUGGER

SYMD simplifies debugging by utilizing your source code symbols and line numbers. SYMD also lets you: Examine/change real numbers; Assign permanent breakpoints; Backtrace instruction execution sequences; Profile your program to find the most active spots. And much more. Introductory price at only $90.
D&V Systems
400 Amherst St.
Nashua, NH 03060
(603) 881-7140

CONVERT YOUR DISKETTES!

With CONVERT—the critically acclaimed disk conversion program. CONVERT runs on the IBM/PC & compatibles. It reads, writes and FORMATS diskettes for over 30 different CP/M computers. CONVERT is the standard in disk conversion software ($99). MC/VISA accepted. Dealer inquiries invited.
SELFWARE, INC.
3545 Chain Bridge Rd., Suite 3
Fairfax, VA 22030
(703) 352-2977

FILE DISPLAY

The utility command that IBM forgot! Displays any file (program, data, etc.) in an easy-to-read ASCII/HEXADECIMAL format. Use with hard or floppy disks. Verify file contents. Start display at any record. Useful for turnkey systems. A must for every system. $40. (CA res. add 6% tax). PC, XT or compatible.
DATA STRATEGIES, INC.
332 S. Juniper St., Suite 210
Escondido, CA 92025
(619) 489-9218

CP/M WINCHESTER BACKUP

Backup database from a Winchester to a floppy.
- Automatic Volume Management.
- Selective File Backup/Restore
- Database Backup/Restore-under CP/M & CCPM
- Compression-reduces space required to store.

Requires IBM/XT or clone with 128K RAM & 1 diskette and Winchester drives. For ccpm & CP/M 86 $99.

AWARD SOFTWARE, INC.
236 North Santa Cruz Avenue Los Gatos, CA 95030

AWARD SOFTWARE, INC.
236 North Santa Cruz Ave.
Los Gatos, CA 95030
(408) 395-2773

COPYWRITE

COPYWRITE MAKES BACK up copies of all IBM PC software. No exceptions. CopyWrite is revised monthly, to keep up with the latest in copy protection, and comes with a trade in offer. It needs an IBM PC or XT, 64k bytes and one disk drive, but can use more memory or another drive.
Price $50 US funds. U.S. Inquiries
QUAID SOFTWARE LIMITED
620 Jarvis Street, Suite 2412
Toronto, Ontario M4Y 2R8 Canada
(416) 961-8243

PADLOCK/PADLOCK II DISKS

PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS commands. $99. PADLOCK II disks come preformatted with finger-print and serialization. PADLOCK II disks offer superior protection. Ask about our fast data encryption product. All work with hard disk, EXE/COM files and all DOS versions. MC/VISA.
GLENCO ENGINEERING
3920 Ridge Ave
Arlington Hts., IL 60004
(312) 392-2492

DOS Command Processor

File name expansion, command completion, and selective retry from a command history list (all with function keys). Flexible command line editing. Implements all DOS shell internal commands. Microsoft mouse support. Plus UNIX-like support tools (improved DIR, word count, etc.). Shell and tools $55
LEMMA SYSTEMS INC.
1508 Calle Del Ranchero NE
Albuquerque, NM 87106
(505) 268-7220

dREPORT FOR dBASE II

The Ultimate dBASE II Report Generator! Multi-file reports using 40 output fields, 9 selection criteria using 7 Boolean operators, 8 break levels with totals, subtotals, counts, 5 lines of output w/adjustable field widths. Multi-level sorting using dBASE II indexes. Titles & field headings. Only $95 + $5 s/h
AUTOMATED OFFICE SYSTEMS
4160 Club Dr.
Atlanta, GA 30319
(404) 237-9420

FILEPATH VERSION 2.0

IBM-PC & PC/XT Owners You Need FilePath Version 2.0. An Advanced DOS 2.0/2.1 Command

*** POWERFUL USEFUL ***
*** CONVENIENT INEXPENSIVE ***
*** FIRST TIME USE OF WILDCARDS ***
*** IN PATH DEFINITIONS ***

Utilize the full power of DOS 2.0/2.1 directories with the advanced FilePath Version 2.0 command. Structure your files logically by application. Defines search paths for files like PATH does for commands. Crosses drive boundaries. Allows programs running on one directory or subdirectory to automatically access files in other directories or subdirectories. Can search all subdirectories in a specified directory. Eliminates the need for multiple copies of Default, Help, Configuration, and Overlay files. If you use LOTUS 1-2-3, WORD-STAR, PC TALK III, etc., you NEED FilePath Version 2.0.

*** CORPORATE LICENSES AVAILABLE ***

Send $24.50 plus $2.00 handling to:
SDA Associates, Department E, Box 36152
San Jose, Ca. 95158-6152 (408) 281-7747
California Residents Add $1.60 Sales Tax

BLUEBOOK

PRINT MAGIC—$39.95
Your IBM/Epson printer can do it all! Layout pages every way imaginable: sideways; as a booklet, pamphlet .Set margins, char set, style & size (to 35 char per inch!). Preview on screen. Create & edit char sets (20 included!). Complete online help. Much more. All in easy menus. DOS, 128K. Check, MO (PA+6%)
DigiCon Print Package
Digital Concepts
PO Box 8345
Pittsburgh, PA 15218

SCREEN MANAGEMENT SYSTEM
SMS is simply the best utility available for designing, using, and saving color/monochrome screens. GOSUB's are supplied in BASIC to input, output, and edit screen data fields. Loads of extra features. We have been in business 15 years, winning many awards for programming excellence. Price $195, demo $50, Manual $10. VISA/MC. PC/XT/PC jr./64K/1 Disk.
DNA SYSTEMS, INC.
P.O. Box 1424
Saginaw, MI 48605
(517) 793-0185

SDA FILEPAC
ADVANCED DOS 2.0/2.1 FILE UTILITIES

*** POWERFUL USEFUL ***
*** CONVENIENT INEXPENSIVE ***
*** FIRST TIME USE OF WILDCARDS ***
*** IN PATH DEFINITIONS ***

Four DOS 2.0/2.1 file utilities that can, on one or many directories, crossing drives as required, locate files and their file descriptions, delete files, remove directories, and modify file attributes. With a single command, and on one or many directories.
(1) SDADIR can locate any file and its file description or multiple files and their file descriptions; better yet, it can generate sorted lists by name, extension, date, size, and/or attributes;
(2) SDADEL can delete any file or multiple files;
(3) SDARD can remove any directory or subdirectory and all its files, or multiple directory/subdirectories and all their files,
(4) SDACHMD can modify the file attributes of any file or the file attributes of multiple files.

*** CORPORATE LICENSES AVAILABLE ***

Send $29.50 plus $2.50 handling to:
SDA Associates, Department E, Box 36152
San Jose, Ca. 95158-6152 (408) 281-7747
California Residents Add $1.92 Sales Tax

SNOOP-DISKETTE UTILITY
Produce graphic maps of diskettes and files. Comprehensive diskette analysis. Add, delete or modify labels. Pageable directory. Change file attributes. Display, modify or search diskettes or files. More, in a single, easy-to-use program. Reqs 64K, DOS 1.1, 2.0 or 2.1. PC, XT, JR & many compatibles, mono or color. Introductory price $40, with manual.
OTTER CREEK SOFTWARE
75 Hunting Lane
Goode, Virginia 24556

Hard Disk DIRECT ACCESS™
The ULTIMATE utility for any hard disk user. DIRECT ACCESS is a powerful hard disk management tool. Organizes your software programs into a "user defined" menu system. Features attractive screen display, rapid access into an application using a single keystroke & easy to learn. Also handles batch files & complicated DOS commands. Order today. Only $44.50 + $2.50 shipping. MC/VISA.
DELTA TECHNOLOGIES
PO Box 1104
Eau Claire, WI 54702
(715) 832-0958

DOS PATH Command For Data
Now your programs can access data files under DOS 2.0+ no matter where they are located. DPATH, a system—resident program extending the functionality of your DOS PATH command to include data files, includes a screen—oriented maintenance utility and a 60-page user manual. Requires PC-DOS 2.0. $25
PERSONAL BUSINESS SOLUTIONS, INC.
P.O. Drawer 757
Frederick, Maryland 21701

DOS TOOLS™ UTILITY PACKAGE
Unique, valuable utilities for DOS 2.0 + 2.1, not found elsewhere. Ends confusion + let all pre-2.0 programs use subdirectories. Move files between directories, remove deleted entries to speed searches + free disk space, show "tree" graph, log DOS usage. Over 30 programs, too much to describe here, for $65 + shipping.
Village INFORMATION CO., INC.
70 Greenwich Ave. Suite #300
NY, NY 10011
(212) 319-6420

COPY II PC
COPY II PC backs up protected & unprotected software, with verification. Available memory is fully utilized to minimize disk duplication time. Also includes a drive speed utility that can pinpoint drive problems. For IBM-PC. $39.95 + $3 s/h ($outside North America). Prepayment required. IBM PCjr version coming soon!
CENTRAL POINT SOFTWARE, INC.
9700 SW Capitol HWY #100B
Portland, Oregon 97219
(503) 244-5782

MICROSOFT XENIX-UNIX SYS 3
Multi-user, multi-tasking System III plus Berkeley enhancements. Bourne Shell, "C" shell, the vsh visual shell, vi, almost 200 Utility prgms. Networking via uucp and Micnet (LAN). Utilities move files between DOS & XENIX. File & Record locking. 10 simultaneous prgms. Total OS-$595. Development pkg $595, Text pkg $495, all $1350.
Unidot Systems
602 Park Point Drive
Golden, CO 80401
(303) 526-9263

SOFTWARE
WORD PROCESSING

MULTIMATE™
Multimate™ is a function key oriented, menu-driven word processor comparable to larger dedicated systems. The system offers over 100 WP functions and utilities including an 80,000 word speller/dictionary, merge, boiler plate callback and the most advanced printing and sheetfeeder capabilities. An on-line help-facility, complete users manual and adhesive color coded key tabs are provided to facilitate minimal training time. A truly user friendly system.
SOFTWORD SYSTEMS, INC.
52 Oakland Ave , North
E. Hartford, CT 06108
(800) 243-4646

WordPerfect
A powerful word processing package which comes with special features such as a spelling dictionary, math, text columns, footnotes, headers/footers, and macros. Proportional spacing and special characters such as Greek, math and foreign symbols are supported. Easy to learn and use. $495.
SATELLITE SOFTWARE INTERNATIONAL
288 West Center Street
Orem, UT 84057
(801) 224-8554

OFFICEWRITER
A Wang-like word processor designed for first-time users. Continuous screen formating and logical keyboard layout make OfficeWriter one of the most natural word processors on the market. Advanced features include mail merge, data base and spreadsheet interface, and document to ASCII conversion. On-screen tutorial and help facilities included. $325.
OFFICE SOLUTIONS, INC.
5708 Odana Road
Madison, WI 53719
(608) 271-5047

LASER TYPE
Laser Type is an intelligent text formatter capable of generating table of contents, preface, index, line tables for term papers, software & technical manuals, & books. Laser Type is highly command oriented with sophisticated commands including keep areas, font selection boxed text, chapter, section, subsection. $395.
SOFTLAB, INC.
PO Box 879
St. George, UT 84770
(801) 628-4969

PC-WRITE™
Features: wordwrap, search/replace, justify, block move/copy/delete, headers/footers, etc. Help screen, quick ref card, 100 page manual. Split screen, edit two files at once. Disk with software and manual $10; registration with support, source, and commissions $75. Shareware: can copy and share with others. Visa/MC.
QUICKSOFT
219 First North #224c
Seattle, WA 98109
(206) 282-0452

AUTHOR'S ANALYST
This program analyses the complexity of sentences, paragraphs, and documents, alerting the author to poor sections that may need rewriting. Trite phrases are also marked. Works with both Wordstar and ASCII files. If you spent $300 on a word processor, why not spend $35 to make the words good? $35, check or M.O.
MDS SOFTWARE ASSOCIATES
132 Laurel Way, #2B
Herndon, VA 22070
(703) 435-4674

USER GROUPS

PC BUYERS GUIDE
THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only $7.95 (+ $1.00 shipping/handling) to U.S. destinations; and $10.00 (+ $3.00 s/h), elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, NY, and VT, add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
PO Box 555
Morris Plains, NJ 07950

PC: Mart

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)

64K DYNAMIC RAM ICs
200 ns @ $5.67
150 ns @ $5.87

These are the ICs you need to expand your IBM PC memory. Install these yourself in the motherboard or an expansion board. Our prices are often half that of retail stores. Our quality is second to none.

We sell other memory ICs.
27128, 2764, 6264, 256K, etc.

VISA or UPS CASH COD
Factory New, Prime Parts
MICROPROCESSORS UNLIMITED
(918) 267-4961
Prices shown above are for Apr 1984
By the next morning via Federal Express Standard A $5.00

We Help Bring
Your Family Together

6 Types of Charts and Sheets
Indices
User Fields
Notes, Footnotes and Sources
No Limits
Adapts to Your Hardware
Comprehensive
Easy to Use
And Much, Much More

Send for brochure and sample printouts. Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II® or IBM PC®.

Other genealogy software also available.

Price
$185 plus
$3.50 Postage
Visa, MasterCard Accepted

Family Roots
QUINSEPT, INC.
P.O. Box 216, Lexington, MA 02173 (617) 862-0404

GREAT DISKETTES
Super low prices
SYNCOM

New low priced high quality diskette with a LIFETIME WARRANTY. Packed in poly bags of 10 with Tyvek envelopes, labels and reinforced hubs. One of the best buys we've seen.

$1.39 ea. 5¼" SSDD QTY 20
5¼" DSDD ea. $1.85 QTY 20

OTHER GREAT VALUES:
DISKETTE 70 — holds 70 5¼" diskettes in dust free safety $14.95 ea + $4 Shipping
DISK CADDIES — Flip up style holds 10 5¼" diskettes $1.65 ea • 20 Shipping
$15.00 Bonus Offer!
For the lowest priced, highest quality diskettes, storage cases, printer ribbons and paper products, send for our catalog. FREE with your order $15 or otherwise. BONUS: Every catalog includes $15.00 worth of bonus coupons.
Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fraction thereof. OTHER ITEMS: Shipping charges as shown in addition to diskette shipping charges. Payment: VISA or MC. COD orders add $3.00. Taxes: Illinois customers, please add 8%.

Nationwide: 1-800-621-6827
In Illinois: 1-312-944-2788
Minimum Order $35.00
WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE!
DISK WORLD!
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611
SYNCOM

CIRCLE 837 ON READER SERVICE CARD

SAVE MORE
THAN EVER ON
3M Scotch®
DISKETTES

LIFETIME WARRANTY!

$1.85 ea 5¼" SSDD (744) Qty 20
5¼" DSDD (745)
$2.35 ea Qty 20

5¼" SSDD—96TPI (746) $2.60 ea
5¼" DSDD—96TPI (747) $3.25 ea
8" SSSD (740) $2.05 ea
8" SSDD (741) $2.50 ea
8" DSDD (743) $3.10 ea

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fraction thereof. 8" DISKETTES—Add $4.00 per 100 or fraction thereof. OTHER ITEMS: Shipping charges as shown in addition to diskette shipping charges. Payment: VISA or MasterCard. COD orders only, add $3.00. Taxes: Illinois customers, please add 8%.

Hours: 9 AM-5 PM Central Time
For fast service call
Nationwide: 1-800-621-6827
In Illinois: 312-944-2788
DISK WORLD!
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611
Authorized Distributor
Information Processing Products
3M

CIRCLE 830 ON READER SERVICE CARD

5¼" FLOPPY DISK DRIVES
SALES—EXCHANGES—REPAIRS

Lowest Prices in USA

Tandon
New TM100-2 ..... $215

CDC
9409 DS/DD 48TPI $215

TM100-1 ..... $175
TM100-4 ..... $295
TM55-2 ..... $225
CDC9409T $295

Call For Free Brochure For Other Products
At Similar Discounted Prices

DISK RESOURCE SERVICES
590 W. Merrick Rd. Valley Stream, NY 11580
(516) 825-2440

SAVE ON
MEMOREX
DISKETTES

$1.80 ea 5¼" SSDD Qty 20
$2.35 ea 5¼" DSDD Qty 20

5¼" SSDD 96TPI $2.49 ea 5¼" DSDD-96TPI $3.25 ea
Boxed in 10's with Tyvec sleeves, reinforced hubs and labels

DISKETTES FOR MACINTOSH & HP-150
AT TERRIFIC SAVINGS!
3½" Memorex $3.99 ea
See our big ad in this issue for other great values!

Shipping: 5¼" or 3½" DISKETTES—Add $3.00 per 100 or fewer diskettes. Payment: VISA and Mastercard accepted. COD orders only, add $3.00 handling charge. Taxes: Illinois residents, please add 8% sales tax.

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE
ON THE SAME PRODUCTS AND QUANTITIES!
Nationwide: 1-800-621-6827
Illinois: 1-312-944-2788
Hours: 9AM - 5PM Central Time
Minimum Order: $35.00
DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611
MEMOREX

CIRCLE 832 ON READER SERVICE CARD

IBM PC † COMPATIBLE Model 120

Model 119
128K, disc control, multifunction card (without drive) (8 expansion slot) $1300
12 expansion slot
(front facing for above)

PARTS FOR ABOVE:
Power Supply 65W $150
Color graphic card $220
8088 main board $450
Bare board $50
Keyboard from $160
Disc controller $220
CASE $120
US$420
16 bit CPU Board
64K Apple ★ compatible
IBM $25

-Add 5% as shipping charge
-Full repair & guarantee available
ABC COMPUTERS LTD. PH: (604) 254-2834 & 254-1062
883 E. HASTING ST., VANCOUVER, B.C. CANADA V6A 2Z5
TELEX: 04-51338 ABC
† Trademark International Business Machines Corp.
★ Trademark Apple Computer Inc. Dealer inquiries welcome

IBM SPECIAL $2,449 256K PC

2 Floppies 360K controller

KEYBOARD $125 IBM COLOR CARD $249
PLANTRONICS COLOR PLUS $379
immediate availability

IBM — XT in stock!!! $ CALL

COLUMBIA CORONA EAGLE XT SEEQUA $CALL

BHAT- NEVADA (800) 845-5555
ORDERS & INFORMATION (702) 451-3305
P.O. BOX 50029 HENDERSON, NV 89016 Mon. Fri. 7:00 AM 5:30 PM

CIRCLE 841 ON READER SERVICE CARD

EMULATE *HP* TERMINALS
WITH YOUR IBM PC

Now your IBM Personal Computer can be used as a Hewlett-Packard 26XX family terminal. Instead of just a terminal, you'll have a general purpose microcomputer. VDTE 2 is the powerful, easy to use terminal emulation program that provides the features you need!

HP2624, HP2648 and DEC VT52 modes
HP2624 block format mode
Eight displayed softkeys (program controlled)
Subset of HP2648 vector graphics
Supports both serial ports simultaneously
Fourteen pages of off-screen scrolling memory
Tens speeds include 300, 1200 and 9600 baud
General purpose file transfer between PC and host

Price $200. Visa and MasterCard welcome

Inner Loop
Inner Loop Software
5456 McConnell, Ste 120
Los Angeles, CA 90066
(213) 822-2800

SPF/PC™

ACTUALLY, there is no comparison. SPF/PC is the best full-screen editor available for the IBM Personal Computer.

It looks and works like IBM's large system SPF editor.

- SPF/PC can use up to 786K of memory as workspace.
- Word processing commands.
- 4-way scrolling.
- Split screen support.
- On-line help facility.
- Can edit up to 240 character records.
- Monochrome or color supported.
- Instantaneous screen display.
- Block Move/Copy/Repeat/Delete/Overlay/Shift/Exclude
- Automatic line numbering supported.
- 40 user-definable Program Function Keys.
- Direct interface to DOS commands for PCDOS 2.0 users.
- Browse sub-system.
- Move/Copy sub-system copies any file format.
- Utilities include: Rename/Delete/Print/Directory list.

AND MUCH MORE . . .

UPLOAD/DOWNLOAD sub-system available to SPF/PC users for $50.00.

$149.95 SPF/PC requires 128K, PCDOS, and 1 disk drive.

THE ODD-COUPLE™

Allows the APPLE and IBM/PC to communicate with each other.

- Connect APPLE to PC, APPLE to APPLE, and PC to PC.
- Transfer any file in either direction.
- CHAT mode allows direct communications through the keyboard.
- An Equipment Profile allows description of your operating environment.
- Communicate Direct or through a Modem at speeds up to 9600 baud (bps).
- Written entirely in machine language for speed and efficiency.

REQUIREMENTS:

APPLE — 48K, 1 disk drive, Serial Interface
IBM — 64K, 1 disk drive, Serial Interface

$79.95

For orders and dealer information write or call Rogue River Software, 2822 Tahitian Ave., Medford, OR 97504, (503) 779-3002. Mastercard/Visa, Check, or P.O. accepted. Add $5.00 for shipping. Canada $10.00. Foreign $15.00.

IBM is a registered trademark of International Business Machines, Inc. APPLE is a registered trademark of Apple Computer Inc

CIRCLE 182 ON READER SERVICE CARD

QUENTIN

QUENTIN! DESIGN WITH THE USER IN MIND...

Quality, Reliability, Value...Compatibility



QUENTIN Q-450 Streamer Tape Backup System is an economical backup for the IBM-PC and IBM-XT hard disk systems. QUENTIN is flexible. The Q-450 can be used on line like a floppy disk or in a streaming mode for Winchester disk backup.

QUENTIN Q-450 has a 26 megabyte formatted capacity. The Q-450 employs standard 1/4" tape cartridges (removable media) and has partial or complete backup capability as well as CRC recording for error detection. The Q-450 provides fast efficient backup and archival storage.

QUENTIN Q-450's bottom line . . . quality, reliability, and high performance at a reasonable price. . . QUENTIN!

For more information see your local computer dealer. Or, phone or write Quentin.

Quentin Corporation, 9207 Eton Ave., Chatsworth, CA 91311 / (818) 709-6500

Dealer Inquiries Invited.

Quentin is a registered trademark of Quentin Corporation. / IBM-PC/IBM-XT are registered trademarks of International Business Machines, Inc.

CIRCLE 497 ON READER SERVICE CARD

WANTED

"Buyers," & "We'll pay the shippin'

• CALL FREE (800) 654-4058 •

"Call For Reduced Prices At Various Quantities"

REDUCED CALL

Verbatim.

5¼" sin·side dbl·den.	2.40
5¼" dbl·side dbl den.	3.45
5¼" sin·side quad	3.20
5¼" dbl·side quad	4.40
8" sin·side sin·den.	2.75
8" sin·side dbl·den.	3.40
8" dbl·side dbl·den.	3.40

Dysan

5¼" sin·side dbl·den.	3.20
5¼" dbl·side dbl·den.	4.40
5¼" sin·side quad	4.40
5¼" dbl·side quad	4.95
8" sin·side sin·den.	3.45
8" sin·side dbl·den.	4.40
8" dbl·side dbl·den.	4.95

3M Scotch®

5¼" sin·side dbl·den.	2.20
5¼" dbl·side dbl·den.	3.20
8" sin·side sin·den.	2.35
8" sin·side dbl·den.	2.95
8" dbl·side dbl·den.	3.90

Head Cleaning Kits.... 5.20 Refills.. 9.55

We Stock "Bulk-Packed" Diskettes

Disk Minder
• Smoked Plastic
• Holds 75 Disks
16.75 ea

Prices per ea. 10 per box

Dealer Inquiries Welcomed

the Diskette Connection™

PO Box 1674 Bethany OK 73008

*(Continental U.S. only, Add 3.00 on orders under 40.00)

CIRCLE 412 ON READER SERVICE CARD

The Statistician



- Multiple Regression
  - Stepwise
  - Ridge
  - All Subsets
  - Backward Elimination
- Time Series Analysis
- Descriptive Statistics
- Transformations
- Survey Research
- Nonparametrics
- X-Y Plots
- ANOVA
- Random Samples
- Data Base
- Search & Sort
- Hypothesis tests

Please call **TOLL FREE**
1-800-334-0854 (Ext. 814)

for more information or write:
Quant Systems
Box 628
Charleston, SC 29402
(803) 571-2825
VISA-M/C Accepted

Quant Systems

CIRCLE 229 ON READER SERVICE CARD

NOW AVAILABLE IN THE U.S.A.

THE HIGH-QUALITY AMAGASAKI DOUBLE SIDED-DUAL DENSITY 5¼" DISKETTE



and just $24.95 per box of 10

N.J. Residents add 6% Sales Tax. Shipping & Handling $2.00 per Box Via UPS (USA only)

Now $4.50 diskette quality at almost half the price. For the first time, the highly regarded AMAGASAKI FLOPPY DISKETTE is available through COMPUSA, CORP. to the U.S. Market.

Top quality and reliability doesn't have to cost a fortune. Send for a box today and see why!

COMPUSA **COMPUSA CORPORATION**

5 EASTMANS ROAD, PARSIPPANY, NEW JERSEY 07054

(201) 654-7220

CIRCLE 154 ON READER SERVICE CARD



Precision Data Products
P O Box 8332
Grand Rapids, MI 49508-0332
Outside U.S.A. (616) 452-3457
Michigan 1-800-632-2468
Outside Michigan 1-800-258-0028

3M Brand Diskettes @ Our Prices + Toll-Free Ordering = Error Free Performance

VISA **Precision Data's Prices** MasterCard

Unlimited Warranty on All 3M Diskettes

3M 8" Diskette	Per Diskette (Orders of 50 or more)
Single Sided - Single Density - Soft or Hard Sector	
SS - SD Storage Box	$1.94
SS - SD Bulk with Envelope No 3M Logo	$1.69
Single Sided - Double Density - Soft or Hard Sector	
SS - DD Storage Box	$2.49
Double Sided - Double Density - Soft or 32 Hard Sector	
DS - DD Storage Box	$2.79
3M 5¼" Diskette	
Single Sided - Double Density - Soft or Hard Sector	
SS - DD - RH Storage Box	$1.84
SS - DD - RH Bulk with Envelope No 3M Logo	$1.65
SS - DD - 96 TPI - RH Storage Box	$2.49
Double Sided - Double Density - Soft or Hard Sector	
DS - DD - RH Storage Box	$2.39
DS - DD - RH Bulk with Envelope No 3M Logo	$1.99
DS - DD - 96 TPI - RH Storage Box	$3.19
Apple Fileware Compatible	$4.24
DEC RX 50 Compatible	$2.89
3M Certified Data Cartridges	
DC 100A	$13.35
DC 300XL	$20.65

COMPLETE LINE OF 3M DATA RECORDING PRODUCTS

Shipping & Handling $3.00 50 Diskettes Continental U.S.A. *MI Residents add 4% Sales Tax*
Surcharge of 10% for quantities less than 50 Diskettes

PIPELINE COMPUTERS

The Source For All IBM Compatible Products

SANYO UPGRADE KIT

★ One Teac 360K Disk Drive
★ Software for 360K Drive
★ Twice the Storage Capacity

List $399 **$239**

APPRICORN PORTS

★ Parallel Card or Serial Card

List $149 **$89**

IBMPC SYSTEM W/10 MEG

★ 256K, 2-360K Disk Drives
★ 10 Meg Hard Disk
★ Interface Card & Monitor

Other Configurations Available

List $4795 **$3495**

JUKI PRINTER

★ Model No. 6100
★ Bidirectionally 18 cps
★ Proportionally spacing

List $599 **$449**

IDEA MODEM

★ PC Internal 1200 Baud
★ Hayes Compatible
★ Complete w/software

List $495 **$349**

MAYNARD HARD DISK

★ 10 Meg Internal
★ Controller
★ Software Included

List $1495 **$998**

COMPAQ SYSTEM

★ 2 Drives, 360K
★ 256K of Ram

List $3495 **$2395**

64K MEMORY EXPANSION

★ 1 Year Warranty
★ 9 to a Set

List $89 **$49**

EPSON PRINTER

★ FX80
★ 160 cps

List $699 **$489**

PC DUST COVERS

★ Covers Monitor
★ Keyboard & Mainframe

List $29 **$19**

TEAC DISK DRIVE

★ FD55B
★ 360K Slimline
★ PC Compatible

List $299 **$169**

TAVA PC

★ 16 bit cpu ★ 128K Ram
★ Two 360K Drives
★ Mono Monitor
★ Parallel & Serial Ports

List $2495 **$1789**

The Source!

MasterCard

PIPELINE COMPUTERS

- We Accept MC, Visa, Wire Transfers, Certified Checks
- COD's Avialible
- All Prices Reflect a Prepaid Discount
- Shipping Minimum 4.50
- Purchase Orders Accepted
- This Ad Supersedes all Others

Prices Subject to Change

The Source!

VISA

CIRCLE 143 ON READER SERVICE CARD

CALL TOLL-FREE (800) 841-0905
For Lowest Prices & Fast Delivery

IBM COMPATIBLE DISK DRIVES

TANDON

TM-55-2, ½ Height (360K)	$ 209
TM-100-2 (360K)	$ 209

TEAC

FD55A Sgl. Head (160K)	$ 149
FD55B Dbl. Head (360K)	$ 169

PANASONIC — SHUGART

SA455-Panasonic	$ 159

CDC

9409 Dbl. Head (360K)	$ 229

PRINTERS

OKIDATA

ML 82A (120 cps)	$ 319
ML 92A (160 cps)	429
ML 93A (160 cps) 15" carriage	729
82 & 92 Tractor Option	59
92 & 93 Plug & Play	49

C. ITOH

8510AP Prowriter	$ 339
F10-40 Starwriter	979
F-10-55 Printmaster	1319

JUKI

6100, 18 cps ltr. qual.	$ 449
Tractor Feed	129

MODEMS

HAYES MICRO INC.

Smart Modem 300	$ 205
Smart Modem 1200	489
Internal 1200B	399

ANCHOR

Mark VII 300 Baud	$ 94
Mark XII 1200 Baud	269

PROMETHEUS

ProCom 1200	$ 369

RIXON

PC212A, 1200 Baud Stand Alone	$ 409
P212A, 1200 IBMPC	409

U.S. ROBTICS

Password, 1200 Baud	$ 339

NOVATION

Access 123	$ 449

MONITORS

AMDEK

300G, 12" Green	$ 129
300A, 12" Amber	139
310A, 12" Amber Monochrome	169
Color I + Color Composite	299
Color II + RGB w/Cable	409

PRINCETON GRAPHICS

HX12, RGB PC Copy	$ 479

DISKETTES

PIPELINE

Dbl Dbl Reinforced Hub 1 year warranty	$ 19
Flip File Holds 70 (smk plexiglass)	16

IBM & COMPATIBLE COMPUTERS

IBM

PC w/64K, 1 Drive (128K)	$1975
PC w/64K, 2 Drives	2195
PC XT, 128K 10 Meg Disk	4495
PC Jr.	1199

COMPAQ

Compaq 128K, 1 Drive	$1895
Optional Drive	299

EAGLE

PC-2, 128K, 2 - 320K Drives	$2550
PC-2 +	2250

COLUMBIA

1600-1, 2-Drives (360K)	$2595
1600-4, 12MB Hard Disk	3875
MPC-XP Portable	2395

SANYO

MBC 550, 1-Drive, software	$ 789
MBC 555, 2-Drives, more software	1099
MBC 550-2	949
MBC 555-2	1295
Optional Serial Port	99

TAVA

2-Drives, 128K, 2 Ser. 1 Par. Port, Color Graphics Card & Hi-Res. Green Monitor	$1895

INTERFACE CARDS FOR IBM & COMPATIBLES

AST RESEARCH

SixPac + 64K Par. & Ser. Software	$ 269
Mega + 64K exp. to 512K Ser. Port	269
MegaPack 256K option for Mega	279
I/O + Ser. & Optional Par. Game	149
Additional Ports	49

QUADRAM

Color I	$ 219
Color II	229
Quadlink	449
Quad Board I	239
Quad Board II	269

HERCULES

Color Graphics Card	$ 339

PLANTRONICS

Color +	$ 379

IBM

Dos 1.1	$ 39
Dos 2.1	59
Monochrome Monitor or Adaptor	309

FLOPPY DISK CONTROLLERS

Maynard	$ 169
Maynard w/Ser. Port	229
Maynard w/Par. Port	229
Sigma Controller	159
Vista	159

PC PRODUCTS

Rainbow Color Card	$ 369

AMDEK

MAI Card	$ 489

DUST COVER

Covers Monitor, Mainframe & Keyboard	$ 19

MORE ACCESSORIES

Koala Graphics Tablet	$ 89
8087 Co-Processor	179
Kraft Joystick	39
Par. Printer Cable	39

The Source!

PIPELINE
COMPUTERS

ORDER DESK:
(213) 970-0177
(800) 841-0905

MAIL ORDER:
1142 Manhattan Avenue, CP21

CUSTOMER SERVICE:
(213) 970-0011

Mon.-Fri. 8:00 a.m. to 6:00 p.m.

"More Computer for Your Calculating Dollar"

Try the New

XPC-XT by XOR

Introductory Offer

(Offer expires May 31,1984)

$1995.00

SYS-8100-00



"Need a 16-bit IBM-PC™ to process your data?"

The first IBM™ compatible that IS compatible! A complete system including the PC-DOS™ operating system from IBM™. Two thinline double-sided 5¼" Disk Drives hold 360K of formatted storage each, the other drive opening is fitted with a close-out plate. Removal of the plate will allow room for a Winchester Hard Disk. The Power Supply is like that of an IBM-PC XT™..Hard Disk ready! How compatible is the XPC-XT? It will run 1-2-3™, Flight Simulator™, dBASE II™, WordStar™, SuperCalc™, VisiCalc® and hundreds of others, The system will also support MS-DOS™ 1.1 and 2.1, PC-DOS™ 2.2, CP/M-86™ and Unix Operating Systems. Add-on an additional 192K of RAM for a full 256K of on-board Memory for only $195.00. This computer comes standard with 2 Serial and 1 parallel ports (IBM™ COM1 and COM2). No need to purchase Add-On cards.

Standard Features:

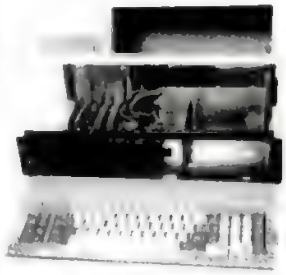
- PC-DOS™ Operating System Vers. 2.1
- 64K of parity checked RAM, expandable on-board to 256K
- 8088 16-bit CPU
- 5 IBM compatible expansion slots
- 4 DMA and 3 Timer channels
- Up to 32K of EPROM (supplied with full 8K)
- DOS BIOS on EPROM
- Full size capacitance touch keyboard with 10 function keys and calculator type numeric keypad
- 8087 Math Co-Processor ready
- 110-220 VAC, 50-60 Hz
- High resolution, 12" Monitor with Green Screen and 18MHz bandwidth.
- Two Slimline 5¼" DS/DD 48 TPI Floppys @ 360K storage each.
- Floppy Disk Controller expansion card, runs up to four SS or DD Floppys
- *ALSO* supports MS-DOS™ and CP/M-86® Operating Systems
- Power Supply is Hard Disk ready, no need to add-on additional power
- Full One Year Parts and Labor Warranty on all **XDS** Manufacturing products!

BASIC XPC SYSTEM

If that incredibly *LOW* Total System price doesn't suit you, try this ***"Do It Yourself System"*** and take your pick of the wide range of options listed below.

The Features: •64K RAM •Expandable to 256K
•4 DMA channels •5 Expansion Slots
•Runs MS/DOS™ and CP/M-86™ (not included)
•Multi-function Keyboard and Cable
•Hard Disk Ready Power Supply
•2 Serial and one Parallel Port
•and MORE! •SYS-8000-00

Only **$895**



The following are registered Trademarks and their Companys 1-2-3-Lotus Development Company; MS-DOS, PC-DOS Flight Simulator-MicroSoft, dBase II-Ashton-Tate, WordStar-MicroPro International Corp , SuperCalc-Sorclm, Inc.; VisiCalc-VisiCorp, Inc.; CP/M-86-Digital Research Inc.; IBM, IBM-PC, IBM-PC XT-International Business Machines

Call or Write for Nearest Dealer and Full Catalog



FLOPPY INTERFACE

This is the standard Floppy Interface Card supplied in all systems not using Tape Back-up. It can access up to four drives in 48 or 96 TPI formats. The same high quality data separator as used in IBM™ counterparts, insures data integrity. BOA-8001-00 ..... **$255.00**



EXPANSION MEMORY

This super reliable, four layer design Memory Card can be expanded from 64K to 576K in 64K increments (at $75.00 ea.). We've tested them all and can recommend this one with confidence. The price below is with 64K and includes Spooler and RAMDISK software.
BOA-8650-00 ..... **$255.00**



CALENDAR CLOCK

This simple but effective Card should be ordered with every system. Battery Back-up (naturally) keeps your Disk Log right up to date. Saves typing in the date everytime you "boot up" the system. BOA-8700-00 . **$149.00**



300/1200 BAUD MODEM

If this is your first computer, you will soon want it to Communicate. Compuserve and The Source are on your screen minutes after you plug-in this Custom Made Unit. Supplied with cable to plug into any wall outlet. Auto-Dial Software "remembers" phone numbers and log-in sequences to ease operation. Software included for each operating system. BOA-8725-00 ..... **$295.00**



SUPER 12 PAK MULTI-FUNCTION

Now we need a full page to describe this fantastic Card! Since we only have a little room, here are the features: IBM™ compatible Joystick Port (2), Real-Time Chronograph (Battery Back-up), Parallel Port, Serial Port, 64K to 384K of Parity Memory, Print Spooler and RAM-DISK software, and supplied with 0K of Memory.
BOA-8680-00 ..... **$345.00**

XDS MANUFACTURING

HARD DISK ADD-ON

Complete Packages

Includes BIOS Software, 5¼" Winchester Hard Disk, mounting hardware, Interface P.C.B. for expansion slot, and all the necessary power and data cables (the Power Supply in the **XPC-XT** is Hard Disk ready).

10 Megabyte	**65 Megabyte**
$995	**$2495**
20 Megabyte	**105 Megabyte**
$1295	**$3295**
40 Megabyte	**140 Megabyte**
$1795	**$4195**

Archive Tape Back-up unit shown above is of 20 and 40 megabyte capacity. **Memtek** unit will soon be available at 10 megabyte capacity at approximately **One-Half the cost!**

MONOCHROME ADAPTOR



If you are impressed with all the rave reviews that the Hercules Graphics Card gets, you will love ours! Made expressly for the **XPC-XT** by Hercules themselves, it runs everything the Hercules Card does (1-2-3™, dBase II, etc.). BOA-8500-00.... **$395.00**

COLOR ADAPTOR



Color and monochrome combinations, can be run *simultaneously*. Flight Simulator™, 1-2-3™ all perform without modifications. *NO FLICKER!* Besides performing perfectly, included are: Light Pen Interface, Print Spooler, and RAM Disk options! BOA-8400-00..... **$495.00**

COLOR
MON-1500-00 **$345.00**

MONOCHROME
MON-1000-00 **$125.00**





Three models of Color to choose from, each with higher and higher resolution. Price from **$345.00** to **$750.00**. Monochrome Unit is outstandingly clear and easy on the eyes. In Green or Amber screens.

HARD DISK ONLY INTERFACE



A simple, quick solution to adding a Hard Disk to your **XPC**. All you need is this card, a Cable, and the Drive. Handles from 5 to 140 megabytes with minimum software configuration. Order with your System now or order later. Compatible with all the operating systems.
BOA-8050-00 ..... **$375.00**

H.D./TAPE CONTROLLER



This package consists of a combination Interface Adaptor having SCSI H.D./TAPE Connector as well as the Floppy Controller. Two additional 5" form factor Boards are included and mount over the Tape Drive and Hard Disk. 10, 20, & 40 megabytes of Back-up is added to your Hard Disk BOA-8675-00 ..... **$750.00**

XDS Manufacturing ■ 5791 Machine Drive ■ Huntington Beach, CA 92649 ■ 714/898-0336

Copyrighted material

CIRCLE 231 ON READER SERVICE CARD

PC User Groups

This list is a partial directory of PC user group names and addresses. Use this listing to locate other PC aficionados who congregate in your area or around the world.

CALIFORNIA

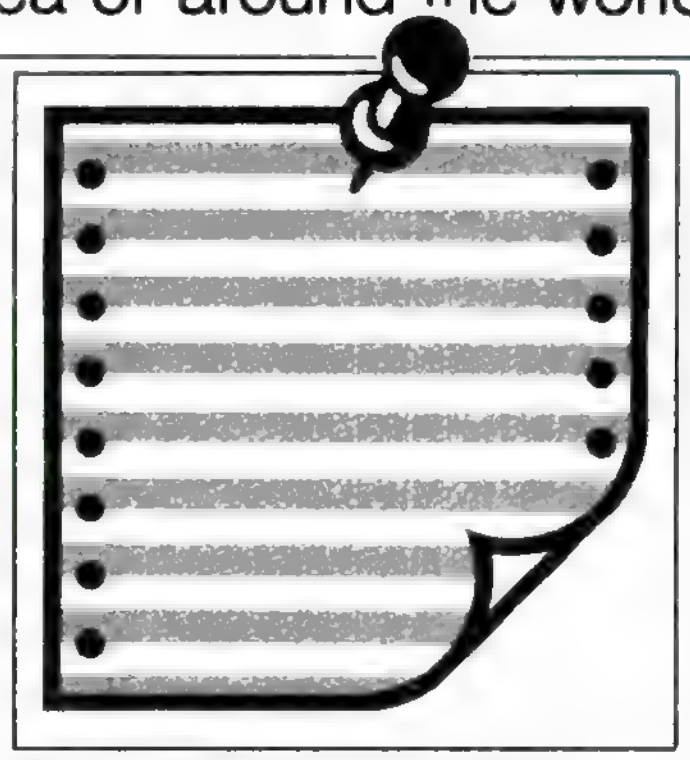
Stanford/Palo Alto User Group
c/o Linda de Sosa
P.O. Box 3738
Stanford, CA 94305
(415) 856-6281

Kern IBM PC Users Group
P.O. Box 2780
Bakersfield, CA 93303
KERNCOM 805/833-0359
Bakersfield, CA
24 hrs, Xmodem, download and upload, messages, 300/450/1200

UCSF IBM PC User Group
c/o Mark Slichter
School of Nursing
N-319Y
U.C., San Francisco
San Francisco, CA 94143
(415) 666-2763

Pomona Valley IBM PC User Group
c/o Roy Livingston
10282 Felipe St.
Montclair, CA 91763
(714) 624-9194

Bay Area User Group
c/o Christian Du Lac
P.O. Box 155
San Francisco, CA 94101
(415) 668-4647



Silicon Valley Computer Society
c/o Elvin H. Bollet
P.O. Box 60506
Sunnyvale, CA 94088
(408) 243-1154

San Fernando IBM PC Users Group
c/o David Nussbaum
11558 Riverside Dr., #207
North Hollywood, CA 91602

Peninsular IBM PC Users Group
c/o Friendly Software Corp.
376 El Camino Real
San Carlos, CA 94070

Greater South Bay IBM PC Users Group
c/o Michael A. Immel
P.O. Box 1937
Redondo Beach, CA 90278-0937

Thousand Oaks Personal Computer Club
(TOPCC)
c/o P. Larson
1264 El Monte Dr.
Thousand Oaks, CA 91362

Rancho California Computer Club
P.O. Box 651
Temecula, CA 92390

San Francisco IBM PC Club
P.O. Box 661
San Francisco, CA 94101

Fresno IBM-PC Users Club
P.O. Box 5987
Fresno, CA 93755

Redding Area PC Society
c/o Ken Daniels
2516 Park Marina Dr., #6
Redding, CA 96001
(916) 243-4411

FLORIDA

IBM Personal Computer Users' Group
c/o Wyatt Bell
The College of Boca Raton
3601 N. Military Trail
Boca Raton, FL 33431

(continued)

PC will publish a periodic listing of PC user groups. Send new addresses or address changes to "Club News," *PC*, One Park Ave., New York, NY 10016. New groups and address changes are shown entirely in **boldface.**

Space Coast PC User Group
c/o John Key
1540 Monte Carlo Cou.
Merritt Island, FL 32952

Central Florida Computer Society
IBM/MS-DOS Special Interest Group
c/o Nick Konya
P.O. Box 639
Goldenrod, FL 32733
(305) 896-7100

Northern Florida Amateur Computer Club
c/o Stephen D. LeBar
10921 Kuralei Dr.
Jacksonville, FL 32216

ORANGE PC
c/o John Momberger
P.O. Box 8005
Orlando, FL 32856
(305) 855-7343

Pinellas IBM-PC Users Group
3401 Gandy Blvd., Lot #628
Pinellas Park, FL 33565
(813) 576-2608

Miami PC User Group, Inc.
c/o Joel Hershkowitz
2350 N.E. 135th St., #1201
North Miami, FL 33181
(305) 940-7566

GEORGIA

Middle Georgia Computer Club
c/o L. Keith Dantzler
P.O. Box 5705
Macon, GA 31208
(912) 477-7009

Microteers PC Users Group
c/o Saundra Mitchell
300 Boulevard, N.E.
Atlanta, GA 30312
(404) 653-3532

Athens IBM-PC User Group
c/o Hugh Christian
255 South Milledge Ave.
Athens, GA 30605
(404) 549-6222 (day)
(404) 543-0139 (night)
Bulletin board: (404) 546-0583

HAWAII

Hawaii IBM PC Users Group
c/o Dick Colven
P.O. Box 22967
Honolulu, HI 96822

Waikiki PC User Group
c/o Lyle Jaller
P.O. Box 15911
Honolulu, HI 96815

Maui PC Users (MPCU)
c/o Michael Skolnick
P.O. Box 1760
Kihei, Maui, HI 96753
(808) 879-8168

IBM PC User Society
c/o Arthur W. Becker, Public Affairs
Box 591
Pearl City, HI 96782

KANSAS

Topeka Library User Group
c/o Becky Hinton
Topeka Public Library
515 W. 10th St.
Topeka, KS 66604

IBM Users Group of Lawrence
P.O. Box 1403
Lawrence, KS 66044

Wichita IBM PC Users Group
P.O. Box 18422
Wichita, KS 67218

KENTUCKY

Kentucky-Indiana Personal Computer Users' Group
c/o Robert D. Hastings
P.O. Box 3564
Louisville, KY 40201
(502) 589-0254
Bulletin board: 6 p.m. to 9 a.m.
502-896-4419

Bluegrass IBM PC Users Group
c/o Diane Skoll
Computing Center
Rm. 72 McVey Hall
University of Kentucky
Lexington, KY 40506-0045
(606) 257-2900

LOUISIANA

The Baton Rouge PC Users Group
c/o Tom Wichser
3375 King Bradford
Baton Rouge, LA 70816

MARYLAND

Baltimore IBM PC Users Group
c/o Ed Honabach
1910 Trout Farm Rd.
Jarrettsville, MD 21084
(301) 557-9965

Capital User Group, Inc.
c/o Jan Withro
P.O. Box 3189
Gaithersburg, MD 20878
(703) 978-1530

Annapolis PC Users Group
c/o Bill Aherne
1409 Forest Dr.
Annapolis, MD 21403
(301) 268-8779

The IBM PC Business Users Group, Inc.
40 W. Chesapeake Ave., #300
Towson, MD 21204

■

Oh No!

Your only copy of vital data.

Lost. Gone.

The file erased or the disk damaged.

It happens to us all.

The solution?
File recovery with:

Norton Utilities™

Oops protection.

The Norton Utilities: a powerful set of tools that supplement DOS for the IBM/PC and compatibles. Works with all versions of DOS from 1.00 through 2.10 and beyond. Works on PC, XT, PCjr, Compaq, Compaq-plus, all fully IBM compatibles, and others.

- ***The Norton Utilities*** provide file recovery tools, and guidance to their use.
- ***The Norton Utilities*** provide disk exploration tools, that help you know and understand your PC better.
- ***The Norton Utilities*** provide other tools to help you use your PC.

Life insurance for your data.

File recovery
Disk exploration

Norton Utilities
and more!

VISA MasterCard



The Norton Utilities
are available from Computerland, and most software dealers.
Or you can order direct, for $80:

Peter Norton
2210 Wilshire Blvd.
Santa Monica, CA 90403

Telephone orders: (213) 399-3948
Visa and MasterCard welcome

CIRCLE 346 ON READER SERVICE CARD

Contemporary ComputerWear

DUST COVERS FOR THE IBM PC



Attire your IBM PC in style! **ComputerWear** is dust protection with class. Design features include select, woven fabric and embroidered emblem. Order now. Satisfaction guaranteed.

☐ **YES**, PROTECT MY PC IN STYLE! SEND ME: ☐ CHECK

____ Keyboard(s) $16 ____ Monitor(s) $18 ☐ VISA

____ Drive(s) $18 ____ Printer(s) $18 ☐ MC

____ 1pc Mon/Drive$36 Add $2.00 Shipping Total: $_____

(CA Res add tax)

Print Name: _____

Address: _____

City/State: _____ Zip_____

Credit Card #: _____ Exp._____

Signature: _____

Contemporary ComputerWear Att: EM

1320 36th Ave./San Francisco, CA 94122 • 415/564-0506

IBM PC is a trademark of International Business Machines Inc.

CIRCLE 196 ON READER SERVICE CARD

DISK MECHANIC T.M.

The ULTIMATE Backup, Analyze & Repair Utility
The Disk Toolkit NO IBM PC Should be Without
Protects Your Software Investment

BACKUP TOOLS:
- Can Backup Most Every Diskette
- SUCCEEDS where others fail!
- Works Manually or Automatically
- Create "Protected" Diskettes
- Many Additional Analysis Tools

FILE TOOLS:
- Show Disk & File Allocation
- Display & Alter File Data
- Repair Damaged Disks
- Recover Erased Files
- Alter "Hidden" Status
- Search Files For Data

SECTOR TOOLS:
- Examine/Print Sector Data
- Modify (ZAP) Sector Data
- Compare, Copy & Zero Sectors
- Search Sectors For Data

HACKER TOOLS:
- Modify Floppy Disk Controller Parameters
- Supports All FDC R/W Commands

DISK MECHANIC works with all standard IBM PC disk formats including "protected" diskettes with mixed track and sector sizes, blank and high track formatting, CRC errors, and single or double sided drives. DISK MECHANIC requires an IBM PC with 128K of memory or COMPAQ with 192K of memory, DOS 1.10, and 2 floppy disk drives. DISK MECHANIC includes a detailed 46 page instruction manual. To Order DISK MECHANIC send check or money order for $70 plus $3 for shipping (Mass. res. add sales tax.) to: MLI MICROSYSTEMS, Box 825, Framingham, Mass. 01701 or Call (617) 926-2055 for Mastercard or VISA orders. Dealer/Distributor inquiries welcome. ©1983 MLI MICROSYSTEMS.

MLI MICROSYSTEMS

CIRCLE 340 ON READER SERVICE CARD

Now For IBM PC!

MCBA Mini-Computer Software For Distributors and Manufacturers

—A FULLY INTEGRATED ACCOUNTING AND DISTRIBUTION MANAGEMENT SYSTEM

- *RM COBOL*
- *SOURCE CODE AVAILABLE*
- *FIELD TESTED — 8 YRS.*
- *UP TO 9 INTERACTIVE MODULES*
- *G/L, A/R, A/P, PR, I/M, C.O.P., P/O B.O.M.P., J/C*
- *Dealerships and Consultant Arrangements Available*

Macola, Incorporated

181 S. Main Street Marion, Ohio 43302

(614) 382-5991

MCBA is a Registered Trademark of Mini-Computer Business Applications

CIRCLE 263 ON READER SERVICE CARD

IBM PC / VT100



EM100
for
IBM PC, XT
PORTABLE and
COMPAQ.
also
APRICOT and
VICTOR 9000.

VT100 emulation with AVO and printer port, English setup menus, 110-9600 BAUD, ASCII file transfer, Modem 7 compatible binary transfer, 132 column support for monochrome or color adapters, soft keys, Mass-11 Greek characters, Keytronics keyboard support, programmable scroll rate & more.

$225.00 single copy,
Site and Corporate Licenses available.

Diversified Computer Systems
P.O. Box 7575 (303) 443-6255
Boulder, CO 80306

Dealer inquiries invited.

Trademarks: VT100 Digital Equipment IBM PC XT IBM Corp VICTOR 9000 Victor Technologies COMPAQ COMPAQ Computers Inc

CIRCLE 166 ON READER SERVICE CARD

Enhancing PC-DOS

Modifying the PC-DOS "environment" turns the SET command into a powerful tool for creating custom abbreviations.

Last year when Microsoft brought forth the latest PC-DOS sibling, PC-DOS 2.0, it included some very sophisticated new features. Some of them make useful additions to a programmer's tool kit.

One programmer's tool, the SET command, has a great deal of unrealized potential. SET lets you create a list of text symbols (or variables) called the "environment," which is held in a reserved portion of memory. You can make these symbols represent longer commands or path names.

The variables and their definitions listed in the environment can be interpreted by any program that was designed with this feature in mind. The PC-DOS 2.0 documentation includes instructions that can be used to locate the environment. But so far, few applications programs have taken advantage of this feature.

Microsoft, in fact, made little use of the environment's capability in PC-DOS 2.0 itself, except when it created three symbols that control system characteristics: COMSPEC for the name of the command interpreter, PATH for the list of directories where executable files can be found, and PROMPT for the current definition of the system prompt.

To make better use of the environment, you must make some changes in the PC-DOS command interpreter—the link between a user and the operating system. Usually, COMMAND.COM is the program used as the command interpreter—so much so that COMMAND.COM's own commands (such as COPY, TYPE, and DIR) are all that most users know of PC-DOS. You send commands from batch files or the keyboard to the command interpreter, and it responds to your requests by loading and starting other programs or performing housekeeping chores such as renaming and deleting files.



Illustration: Michael Ng

Inside COMMAND.COM

This article will give you some background on how some parts of COMMAND.COM operate and a general explanation of a modification that will enable you to use the environment feature

SHELF CONSCIOUS?

Now you can organize your copies of

PC MAGAZINE

Now your magazines can be a handsome addition to your decor, well organized, and easy to find, thanks to these durable library-quality cases or binders. They're made of luxury-look leatherette over high-quality binder board. And both styles are custom-designed for this or any other magazine you save, with size, color and imprint selected by the publisher. FREE transfer foil included for marking dates and volumes.



Magazine binders
holds your issues on individual snap-in rods, combining them into one volume $7.95 each, 3 for $22.50, 6 for $42.95 Mixed titles OK for quantity prices



Open-back cases
store your issues for individual reference $6.95 each, 3 for $19.75, 6 for $37.50 Mixed titles OK for quantity prices

For faster service,
CALL TOLL-FREE
800-526-0790
(In NJ only 201-540-0445)

PC Magazine
P.O. Box 5120, Philadelphia PA 19141
Please send ☐ Cases ☐ Binders

TITLE — QUANTITY
PC Magazine ____
Other ____ ____

☐ PAYMENT ENCLOSED $____* Add $1.00 *per order* for postage and handling. Outside USA add $2.50 *per unit* ordered, send US funds only
☐ CHARGE (Minimum $10)
☐ American Express ☐ MasterCard ☐ Visa

Card No. ____ Exp. Date ____
Signature ____
Print Name ____
Address ____
City ____
State/Zip ____
*Residents of PA add 6% sales tax

to make your work easier. A continuation in a future issue will provide detailed instructions on how to make this modification. It isn't difficult to do, even if you don't understand how it works.

When I designed the modification I did it in three key parts. First, I modified the COMMAND.COM file to give it some extra space, which you must also do. Then I found where input lines are analyzed by the COMMAND.COM program. Finally, I wrote new code that you can insert into COMMAND.COM that intercepts the analysis process to substitute symbol values for symbol names.

> To make better use of the environment, you must make some changes in the PC-DOS command interpreter.

This substitution of symbol values for names, which you do by using the SET command, is a powerful tool. Here's an example of what it allows you to do. Imagine that you have two file directories: one, TAXES\DATA\MARCH \EXPNS, and the other, BUDGET\REPORTS\-MARCH\TAXES. If you must refer frequently to different files within those two directories, you will end up retyping these lengthy directory names many times—a tedious and error-provoking chore.

Using the environment feature, you reduce the number of key strokes in these names by initially typing

```
SET D1=\TAXES\DATA
  \MARCH\EXPNS\
```

and

```
SET D2=\BUDGET\REPORTS
  \MARCH\TAXES\
```

Then, while you work, you can type 'D1' and 'D2' (including the single-quotation marks) as part of any PC-DOS command and get the same results as if you'd typed the directory names in full. PC-DOS will continue to interpret these abbreviations correctly until you turn off the computer or enter

```
SET D1=
```

to erase the symbol assignment. This procedure is analogous to using variables that represent values rather than the values themselves in a BASIC program. (Without this capability, BASIC would be useless as a programming language.)

This modification of the environment permits you to distinguish between characters in a PC-DOS command that are symbols and those that are to be interpreted normally. As I defined it, a symbol name must be inside single quotation marks (such as 'D1' in the example above). The single quotation mark is a good character for this purpose: it has no reserved meaning in PC-DOS, it rarely appears in file names, and it's easy to type.

Expanding COMMAND.COM

In making the modification to COMMAND.COM that permits this use of the SET command, my first step was to add space—a generous 1,024 bytes—to the body of the COMMAND.COM program itself. There's nothing expendable in COMMAND.COM that I could pull out to make room; it's packed full of modules and procedures that execute the commands you enter. After I enlarged COMMAND.COM, the procedures that initialize it had to be changed as well or nothing would work. I therefore had to analyze the code in COMMAND.COM to make sure I had accounted for everything when making changes.

The initialization process begins after COMMAND.COM is loaded into RAM by PC-DOS. In the first stage of initialization, the procedure calculates the address of the highest RAM segment (a segment is a 16-byte block) where the main body of the COMMAND.COM code (the transient part) can be set up. It calculates this segment by taking the total number of segments in the computer and subtracting the number of blocks used by the transient portion of COMMAND.COM. Once I enlarged COMMAND.COM, I also had to change the constant used in this calculation that indicates the size of COMMAND.COM.

Next, the initialization procedure tests a memory location that contains the address of the environment. The operating system will give any program it loads its own copy of the list of environment symbols that have been defined so far. A program can find its copy of the environment by using the address value contained in a specific place in its own header (or prefix).

If the computer has just been turned on or reset, no environment has yet been set up, so the value that would point to its address is set to zero. At this time, however, the initialization procedure calculates an address that points to the area that will hold the environment later. Once an environment exists, the address tells other COMMAND.COM procedures that a "secondary command processor" is invoked. (See page 10-9 in IBM's DOS 2.0 manual for more about secondary command processors.) In either case, whether an environment exists yet or not, an address is moved to a more permanent location where it can be found by COMMAND.COM's procedures, including the new analysis procedure I created.

> The input analysis procedure begins as soon as a command line reaches the COMMAND.COM program.

PC LINK

INDEPENDENT STORE IN NYC DEDICATED TO IBM PC SOFTWARE AND PERIPHERALS ONLY

IN STORE WE DEMONSTRATE MOST PRODUCTS WE SELL—BY APPOINTMENT ONLY

STORE HOURS: 9:00 A.M.–5:30 P.M. E.S.T. MON.–FRI.
Saturdays closed for months of July, Aug., Sept.
Terms, conditions and prices differ in our store.

PC LINK, CORP. 29 WEST 38TH ST. 2ND FL., NEW YORK, NY 10018

HELIX BUBBLE MEMORY BOARDS ..... CALL

WE ARE CELEBRATING OUR FIRST ANNIVERSARY.

All Prices Listed here are strictly subject to our current stock Available for Anniversary Sale.

BUSINESS SOFTWARE

ALPHA SOFTWARE
- DATA BASE MANAGER II $205.00
- EXECUTIVE PACKAGE 109.00
- TYPE FACES 89.00

ASHTON–TATE
- dBASE II (PC DOS) 385.00
- BOTTOM LINE STRATEGIST 299.00
- FINANCIAL PLANNER 399.00
- FRIDAY 179.00

CONTINENTAL
- HOME ACCOUNTANT PLUS 85.00
- ULTRA FILE 139.00
- TAX ADVANTAGE 45.00
- PROPERTY MANAGEMENT 319.00

ENERTRONICS
- ENERGRAPHICS CALL

FOX & GELLER
- D GRAPH 189.00
- DIUTIL 69.00
- GRAFOX 209.00
- OZ CALL
- QUICKCODE 189.00

FRIENDLYSOFT
- FRIENDLY WRITER 50.00

HARVARD SOFTWARE
- HARVARD PROJECT MANAGER CALL

HAYES
- SMARTCOM II 95.00

INNOVATIVE SOFTWARE
- TIM IV CALL

I U S
- ACCOUNTING AR AP GL ea 295.00
- INVENTORY CONTROL 295.00
- ORDER ENTRY 295.00
- PAYROLL 345.00
- EASY WRITER II SHELLER/MAIL CALL
- EASY FILER 240.00
- EASY PLANNER 169.00

LOTUS DEVELOPMENT CORP.
- LOTUS 1-2-3 (NO MAIL ORDERS) CALL
- SYMPHONY (NO MAIL ORDERS) CALL

MICRO DATA BASE
- KNOWLEDGE MAN CALL

MICRO PRO
- INFOSTAR CALL
- WORDSTAR CALL
- WORDSTAR PROFESSIONAL CALL

MICROSOFT
- MULTIPLAN 179.00
- COMPILERS CALL

NORTH AMERICAN BUSINESS
- MEMORY SHIFT 65.00

NORTON COMPUTER
- NORTON UTILITIES 55.00

PC SOFTWARE
- CREATABASE 65.00

PEARL SOFT
- PERSONAL PEARL CALL

ROSE SOFT
- PROKEY 3 0 89.00

SOFTWARE ARTS
- TK SOLVER 299.00
- FINANCIAL MANAGEMENT 89.00
- MECHANICAL ENGINEERING 89.00

SOFTWARE SYSTEMS INC.
- MULTIMATE 295.00

SORCIM
- SUPERCALC III 299.00

VISICORP
- VISICALC FOUR 179.00
- DESKTOP PLAN 190.00
- VISIFILE 190.00
- VISITREND VISIPLOT 190.00
- VISIWORD 190.00

DISK DRIVES
- CORVUS CALL
- PEGASUS CALL
- QUME T142 CALL
- SYSGEN ..... CALL
- TANDON TM 100-2 200.00

MULTIFUNCTION BOARDS
- 64 RAM CHIPS 55.00
- AST CARDS CALL
- QUADBOARD CARD CALL
- AMDEK MAI CARD CALL
- PC MOUSE CALL
- FTG LIGHTPEN CALL
- PLANTRONICS COLOR PLUS CARD CALL
- HERCULES CALL
- PRINCETON GRAPHICS CALL

ENTERTAINMENT & EDUCATION
- ATI TRAINING PACKAGES ..... ea 55.00
- ATTACK ON ALTAIR 29.00
- COMPUTER FACTS IN 5 22.00
- CONQUEST 29.00
- DEADLINE 37.00
- DIGGER 29.00
- THE EXTERMINATOR 29.00
- FLIGHT SIMULATOR 35.00
- FRIENDLY ARCADE 32.00
- FRIENDLY PC INTRO SET 32.00
- FROGGER 25.00
- GORGON 29.00
- HIDE & SINK 22.00
- HI RES #4 27.00
- MOON BUGS 29.00
- MY LETTERS, NUMBERS & WORDS 32.00
- PC CRAYON 39.00
- PC TUTOR 49.00
- PLANET FALL 39.00
- SERPENTINE 25.00
- SPINNAKER SERIES CALL
- SPYDER 29.00
- STYX 29.00
- SUSPENDED 39.00
- WITNESS 39.00
- WIZARDRY 49.00
- ZORK I, II, III ..... ea. 27.00
- ZURAN DEFENDER 25.00

FUNTASTIC
- BIG TOP 27.00
- COSMIC CRUSADERS 27.00
- MASTER MINER 27.00
- SNACK ATTACK 27.00

ACCESSORIES

CURTIS PRODUCTS
- DISPLAY PEDESTAL $50.00
- MONO CABLE 38.00
- KEYBOARD CABLE 30.00
- SYSTEM STAND 17.00

KRAFT JOYSTICK 39.00
HAYES MACH III JOYSTICKS 45.00

MONITORS

AMDEK 310A $175.00
COLOR II + CALL
PRINCETON GRAPHIC HX-12 479.00
SR-12 CALL
ZENITH RGB MONITOR 499.00

MODEMS

HAYES SMART MODEM $205.00
HAYES SMART MODEM 1200 469.00
HAYES SMART MODEM 1200B 449.00

DISKETTES

DYSAN
- S S D D ... $30.00
- D S D D 38.00

MAXELL
- S S S D 27.00
- D S D D 38.00

VERBATIM (5 year warranty)
- 21144 HEAD CLEAN KIT 10:50
- S S D D 26.00
- D S D D 36.00

PRINTERS

DIABLO P32 D-MATRIX CALL
DIABLO 630 $1675.00
DIABLO 630 TRACTOR FEED 249.00
DYNAX DX-15 OR DX-25 CALL
C ITHO PROWRITER 10BPI 399.00
PROWRITER F10 ..... 925.00
IDS PRISM 132 COMPLETE 1499.00
OKIDATA 92P 465.00
93P 699.00
TOSHIBA P1351 1499.00
TOSHIBA P1340 CALL
EPSON FX SERIES CALL
NEC 3550 CALL
PRINTER CABLE/PARALLEL 25.00

CALL TOLL FREE 800-221-0343

All prices listed in this ad are effective July 1-31, 1984. All Brands are Registered Trademarks. IBM is a Registered Trademark of IBM Corp.

IN NEW YORK CALL 1-212-730-8036

TERMS AND CONDITIONS

We reserve the right to repair, replace or return to manufacturer for repair, all goods acknowledged faulty or damaged on receipt by customer ***Customer must call for Return Authorization Number before returning any goods.*** Prompt attention will be given to all damaged and faulty returned goods Any goods returned for credit are subject to 10% restocking charge, plus shipping charge No returns for credit on any software Customer must deal with the manufacturer directly if the customer finds any false claims made by the manufacturer All goods are shipped U PS only Add 2% of price, or minimum of $3 00 for shipping We do not ship C O D Please allow one to two weeks for personal or corporate checks to clear To expedite shipping send money order, certified cashiers check, or charge to your **VISA, MasterCard, WE DO NOT Add a Service Charge For Credit Card Usage.** Prices subject to change without notice NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS

CIRCLE 360 ON READER SERVICE CARD

Next, the main part of the COMMAND.COM program is loaded into the high area of RAM that was calculated earlier. To accomplish this, the disk file of COMMAND.COM is reopened, and the data that starts at offset 0100h within the disk file is read into the high RAM segment starting at offset 0100h. To reflect the increased size of the COMMAND.COM program, I had to modify the part of this loading procedure that indicates the total number of bytes to be read from the disk file.

Afterwards, the initialization procedure executes dozens of other instructions. Some instructions set various pointers and variables for use by COMMAND.COM in general; others are executed if COMMAND.COM has been invoked as a secondary command processor; and still others if COMMAND.COM is executed when the computer is in a power-up or reset state.

The initialization procedure ends with a jump to instructions in the high-memory, transient part of COMMAND.COM. A block of instructions is left behind as the resident portion of COMMAND.COM that handles operating system errors, the EXEC function call, and reloads the larger transient part of the program. I had to change some of the instructions in the resident block to accommodate my expanded transient portion of COMMAND.COM.

COMMAND.COM's Front End

The next instructions to be executed are COMMAND.COM's front end—the procedures that handle command input. These procedures, which reside in the transient portion of COMMAND.COM, are responsible for reading command lines either from a batch file or from the keyboard. If the line you input begins with a command like TYPE or DIR, the input handling procedures transfer control to an internal routine corresponding to that command. If you input a filename, the procedures transfer control to the operating system's file loader.

COMMAND.COM's front end is the beginning of a giant loop within the operating system. Control returns to this point not only at initialization, but every time a command is executed completely or a program exits.

The following things happen in the front-end procedure. First, the COMMAND.COM input buffer (which is used by the keyboard input procedure) is initialized as empty. The proper directory for the disk is selected. If any previous program used the piping feature, the %PIPE files are deleted. A number indicating the current disk drive is retrieved for later use. Then the echo flag is tested; if the result is true, the PC-DOS prompt is displayed.

> The front-end procedures are responsible for reading command lines either from a batch file or from the keyboard.

Next, the batch-mode flag is tested. A non-zero result in this flag points to the batch-file control block for a batch job that is currently executing. This batch-file control block contains the drive, path, filename, and parameter list for the file—information that allows the batch file to be located, opened, and read after other programs have been run. If initialization occurs at power-up, this pointer is set to a control block that specifies AUTOEXEC.BAT (if it exists) as the current batch file.

If you've entered batch mode, the batch file is opened and the pointer is set to indicate the next character in the file. The batch file is read one character at a time into the input buffer (that's why batch files run so slowly) until there's a carriage return or end-of-file marker (1Ah) in the file, which causes the batch file to close. Next, the echo flag is tested again; if the result is true, the characters that were read from the batch file are displayed on the screen. The batch-mode procedure ends with a jump to the analysis procedure, which I'll describe later.

If the batch-mode flag was zero when it was tested, which means that no active batch file was being read, another flag is tested to find whether COMMAND.COM is a secondary command processor. A true result in this test means that the command line to be processed is part of the input line that had invoked an extra copy of COMMAND.COM. This line of input is moved into the regular input buffer from wherever the initialization procedure had stored it. Afterwards, this secondary command processor branch of the front-end procedure jumps to the input analysis procedure.

If the secondary command processor flag was false, then the buffered keyboard input function is called. This function is the familiar one where the computer displays an A> prompt and waits until you enter a line from the keyboard. COMMAND.COM is now ready to analyze whatever you might type.

Input Analysis

The input analysis procedure begins as soon as a command line reaches the COMMAND.COM program, whether it comes from the keyboard or a batch file. At this point, I made the bulk of the modifications—new code that intercepts the command line, finds any symbols surrounded by single quotation marks, and replaces them with a value from the environment's table.

So that you'll understand how I ensured that the new code is compatible with the rest of the COMMAND.COM program, I'll explain how input analysis normally works.

The input analysis procedure first calls a subroutine that scans a line that you input, looking for the input/output redirection symbols (> and <) and the piping symbol (¦). If the subroutine finds one of

these characters (as in a command like DIR >OUTFILE.LST), the filename that follows is moved to a location referred to when keeping track of redirected files. If the input analysis procedure finds double quotation marks, the characters they enclose are not processed.

Next, the input analysis procedure breaks down the input line into an individual filename or command name, and any other parameters or filenames to be passed to the target program or command.

The final stage of the front-end procedure takes the first name on the input line and searches to see if it corresponds to an internal PC-DOS command name or a filename on the disk. If there's a match, COMMAND.COM calls the internal PC-DOS procedure or loads and executes the program with the given filename. If the name can't be found, a message appears saying Bad Command Or Filename.

In either case, the giant loop of the COMMAND.COM front end is completed. After this error message appears, or a program or an internal command is completely executed, the input procedure begins again.

Ready to Modify

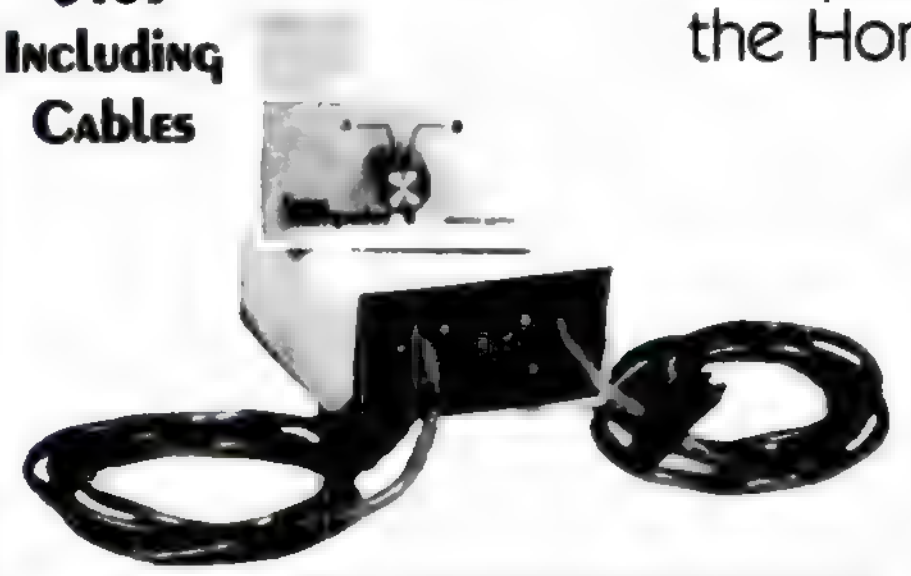
I can insert any new code I desire at the point where COMMAND.COM's front end calls a procedure that strips out the input/output redirection symbols. After my new code is executed, the flow of control returns to this point of input analysis. By making the change here, I avoid any restriction on what text or symbols can be included in the environment's symbol table or on how they can be processed. (If you ensure that the input line ends up where it should be, you can insert a new routine here without restrictions and avoid ing procedures.

In the next installment, I'll give you details on how to change COMMAND.COM to make the environment more useful. I'll identify specific memory locations and variables that are involved and list a machine language subroutine that will do the job. ■

WHAT A SWITCH!

Intra's **Printer Switch** for all Personal and Business Computers lets your **W**ord**P**rocessor's copy be easily directed to either a **D**ot **M**atrix or **L**etter **Q**uality **D**aisywheel Printer. Compatable with all Centronics Parallel type interfaces, the **Printer Switch** is styled to match computer hardware in the Home or Office.

$165 Including Cables



master charge

VISA

intra computer

101 W. 31st Street
New York, N.Y. 10001
(212) 947-5533

CIRCLE 167 ON READER SERVICE CARD

How to teach your kids about the IBM PC.

Computers for Kids teaches children age 8 and older to write their own programs in less than an hour—without the necessity for previous knowledge of algebra, variables, or computers. And there's a special section that keeps parents and teachers on the same successful command path.

Starting off with an easy-to-understand explanation of how to use the IBM PC, your kids will progress quickly to flow charts and simple print programs...to loops, graphics, and other programming concepts that show the young user how to make the PC do exactly what he wants—in non-technical language that makes life easier for both of you.

So do your children a favor. Do yourself a favor. Order the PC edition of *Computers for Kids* today!

Creative Computing Press
Dept. **NV8C**, 39 East Hanover Ave., Morris Plains, NJ 07950

Send me _____ *Computers for Kids*, PC edition, at $5 95 plus $1 50 postage and handling each #12K
Also available at your local bookstore or computer store

☐ **PAYMENT ENCLOSED** $_____ _____. *Residents of CA, NJ and NY State add applicable sales tax. Outside USA add $3.00 per order.*

☐ **CHARGE MY:** (Charge and phone order $10 minimum)
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp Date_____

Signature_____

Mr /Mrs /Ms _____
(please print full name)

Address_____ Apt_____

City/State/Zip _____

☐ Send me a FREE *Creative Computing* Catalog

Everything from A-Z

HARDWARE

ALLOY
Cartridge back-up system for XT. 16.5 meg on a single cart. . . **1795.00**
Interface card for XT included

AST RESEARCH
AST 6-PACK PLUS multi-function board for IBM-PC 64K-384K expandable memory, clock calendar, 1 serial and 1 parallel port, includes Super Drive and Super Spool software (optional game port adapter is available).
6-Pack Plus 64K **269.00**
For game port option add **34.95**

64K RAM set to upgrade memory by 64K **59.00**
(9 to a 64K set) $10.00 installation fee w/purchase of memory board at time of board purchase only.

MICROSOFT
New! Mouse with software . . **129.95**

QUADRAM QUADBOARD
Quadboard is exp. from 64K-256K. 1 serial port, clock calendar and quadmaster software included.
64K Quadboard **259.50**
256K Quadboard *(memory installed)* **399.00**
***New* Expanded Quadboard,** expandable from 64K-384K, 1 parallel 1 serial and game port i/o bracket and quadmaster software
64K expanded quadboard **264.95**
384K expanded quadboard *(mem. installed)* **569.00**
Quadcolor-1 color card **189.95**
Quadlink-allows running of Apple II software on IBM-PC **439.00**

MOUSE SYSTEMS
Mouse with pop-up menus *(requires RS-232 port)* Design your own menus for most programs software included **197.50**

PRINTER BUFFERS
Practical Peripherals-External print buffer connects between your computer and printer (cable required from computer to buffer)
32K in-line parallel with copy feature **199.00**
64K in-line parallel with copy feature **244.95**

STB
RIO PLUS Multi function board 64K-384K exp. memory. 1 serial 1 parallel and game port (game port cable included) clock calendar and PC Accelerator software.
Rio Plus 64K **254.95**
Quadram Microfrazer parallel print buffer with copy feature
MP-16 16K (upgradeable) **139.00**
MP-64 64K (upgradeable) **195.00**
MP-256 256K (upgradeable) . . **595.00**

TALLGRASS
Hard drive sub system with cartridge backup
TG-3012 12 mg. w/backup . . **2995.00**
TG-3020 20 mg. w/backup . . **3395.00**
Interface for PC included
DC-600 Data cartridge **34.95**

CURTIS
PC-I Pedestal for IBM monochrome display **54.95**
AD-1 Adapter for use of PC-I with Princeton Quadrome color monitor **7.95**
UNI/1 Universal tilt and swivel base for use with monitor **36.95**
EC-I 3' monochrome extension cable **36.95**
EC-II 3'-9' coiled keyboard extension cable **27.95**

DISPLAY BOARDS

HERCULES Graphics Board (Monochrome) **339.00**
PLANTRONICS Color Plus . . **369.95**
PARADISE Multi Display Card (Color & Monochrome) **384.95**
STB GRAPHIX Plus (Color & Monochrome) **284.95**

MODEMS

ANCHOR AUTOMATION MODEM
Signalman Mark XII (RS-232C) 1200 Baud modem **289.00**

HAYES
Smartmodem 300 . . . . . **199.00**
Smartmodem 1200 . . . . . **495.00**
Smartmodem 1200B with Smartcom II **399.00**

NOVATION
Access 1-2-3 Internal 1200 Baud Modem with Crosstalk **399.00**
Smart Cat 103/212 External 300-1200 Baud **389.95**
Modem Cable RS-232 . . . . . **24.00**

VEN-TEL MODEMS
PC Half Modem-Internal 300/1200 modem fits in short slot of XT or portable PC crosstalk incl. . . . **449.00**
PC Modem-1200 Internal full size modem 300/1200 Baud with crosstalk **399.95**
1200 Plus-External 300/1200 modem **399.00**
(Requires RS-232 Card and Cable)

MONITORS

AMDEK
300G-12" Green **139.95**
300A-12" Amber **154.95**
310A-(to use with IBM Monocard) Amber **169.95**
Color II Plus-12" Hi-res RGB Color . . . . . **Call**

PRINCETON
HX-12 Hi-res RGB Color **469.95**
MAX-12 Monochrome (to use with Monochrome Card) Amber . . **179.00**

TAXAN
420-12"-super hi-res RGB color **449.00**
122-12"- Amber for PC *(requires monochrome card)* . **159.00**
121-12"-green for PC *(requires monochrome card)* . **169.95**

PRINTERS

OKIDATA
OKI-92 with Plug N' Play . . . . . **Call**
OKI-93 with Plug N' Play . . . . . **Call**
OKI-84 with Plug N' Play . . . . . **Call**
OKI-82 . . . . . **324.00**

PANASONIC
KXP-1090 80 CPS F/T **299.00**
KXP-1091 120 CPS F/T . . . . . **Call**

EPSON
RX-80, RX-80 F/T . . . . . **Call**
FX-80, FX-100, MX-100 . . . . . **Call**

QUADRAM
Quadjet Color Ink Jet Printer **599.95**
ACC Kit for PC Incl. (cable req.)
Parallel Printer Cable for PC . **26.95**

DIABLO
630 API **1699.00**
Tractor Feed **269.00**
Parallel Cable for API:I to PC . **45.00**

NEC
3550 letter quality 33 CPS . . **1625.00**
2050 letter quality, 18 CPS . . **894.95**
Tractor Feed 3550/2050 . . . . . **209.95**

JUKI
6100 18 CPS . . . . . **Call**

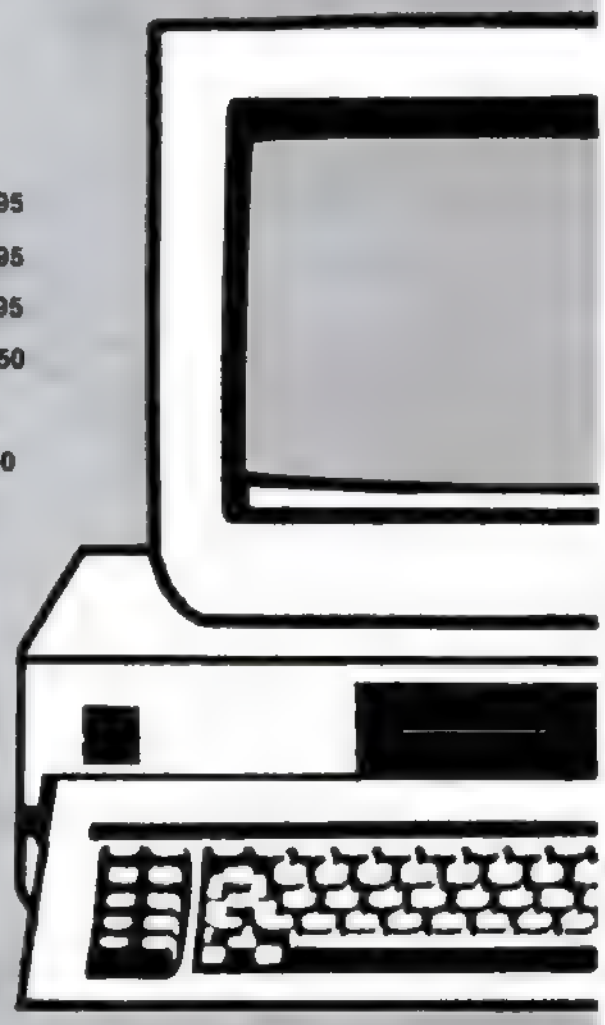
SILVER REED
EXP-550 (16 CPS Wide Carr.) **519.95**
EXP-770 (30 CPS Wide Carr.) **879.00**
Tractor Feed for EXP-550 . . . **124.95**

BROTHER
HR-15 13 CPS **439.00**
HR-25 23 CPS (Wide Carr.) . . **729.00**
Tractor Feed f/HR-15 or HR-25 **124.95**
Single Sheet Feeder for HR-15 or HR-25 . . . . . **224.95**

A-B PARALLEL PRINTER SWITCH BOX
Cables to Printers Included
(Reg. Cable from Computer to A-B Box not included)
$134.95

★ This month's specials

★VISICORP
Req. XT 512K
VISION Graph . **$149.95**
VISION Word . **$224.95**
VISION Calc . . **$236.95**
VISION Mouse **$162.50**
Application Manager . . . **$57.50**
Required to run VISION



★ **INFOSTAR PLUS**
Version 1.6
$249.95
Includes Star Burst

Call or Write us

FLOPPY DISKS

(Packed 10 per box)	SS/DD	DS/DD
IBM 5¼"		34.95
MAXELL 5¼"	23.95	33.95
FUJI 5¼"	23.95	33.95
TDK 5¼"	23.95	34.95
NASHUA 5¼"	17.95	24.95

SOFTWARE

ASHTON TATE
Dbase II **360.95**

ATI TRAINING
Training for Lotus 1-2-3 . . . . . **49.00**
Training for Wordstar **49.00**
Training for Dbase II **49.00**
Training for Multiplan **49.00**
How to use your IBM-PC or XT **49.00**
How to use your COMPAQ . . . **49.00**

BEST PROGRAMS
PC/Tax Cut **149.95**
PC/Personal Finance Prog. II **149.95**

BPS
BPS-Business Graphics *(requires color card)* **179.95**

BUSINESS SOLUTIONS
JACK-2 Integrated Software . **289.95**

CDEX
Training for Wordstar **44.95**
Managing Your Business with Lotus 1-2-3 . . . . . **44.95**
Training for Dbase II **44.95**

CONCENTRIC DATA SYSTEMS
C.I.P. Concentric Information Processor **249.00**

CONTEXT
MBA *(requires 256K)* **429.00**

DOW JONES
Connector **39.95**
Market analyzer *(requires color card)* **259.00**
Market manager **219.00**
Market microscope **499.00**
Spread sheet link **179.95**
Investment Evaluator **109.95**

DAYFLO
Dayflo (XT/256K) **299.95**

DIGITAL RESEARCH
Concurrent CP/M w/windows **229.00**
CP/M 86 . . . . . **36.00**
DR LOGO *(req. color card)* . . . **64.95**
C-Compiler (PC DOS) **219.00**
For other DR products CALL

FUNK SOFTWARE
Sideways **45.00**

FOX & GELLER
Quick Code (MS DOS) **149.00**
Dutil (MS DOS) **54.95**
OZ (256K) *(req. color card)* . . **269.95**
dGraph *(requires color card)* . **159.95**

HARVARD SOFTWARE
Harvard project manager . . . **259.00**

HARVARD ASSOC
PC Logo *(req. 128K/color card)* **99.95**

HERITAGE SOFTWARE
Smartkey II **49.95**

HOWARD SOFTWARE
Tax Preparer 1984 . . . . . **179.95**

HUMAN EDGE
The Management Edge (128K) **165.00**
The Sales Edge (128K) **165.00**

IUS
Accounts Receivable **289.95**
Accounts Payable **289.95**
General Ledger **289.95**
Order Entry **289.95**
Payroll **349.95**
Easywriter II System **189.95**

KNOWARE
Knoware *(requires color card)* **64.50**

LIFE TREE
Volkswriter Deluxe **164.95**

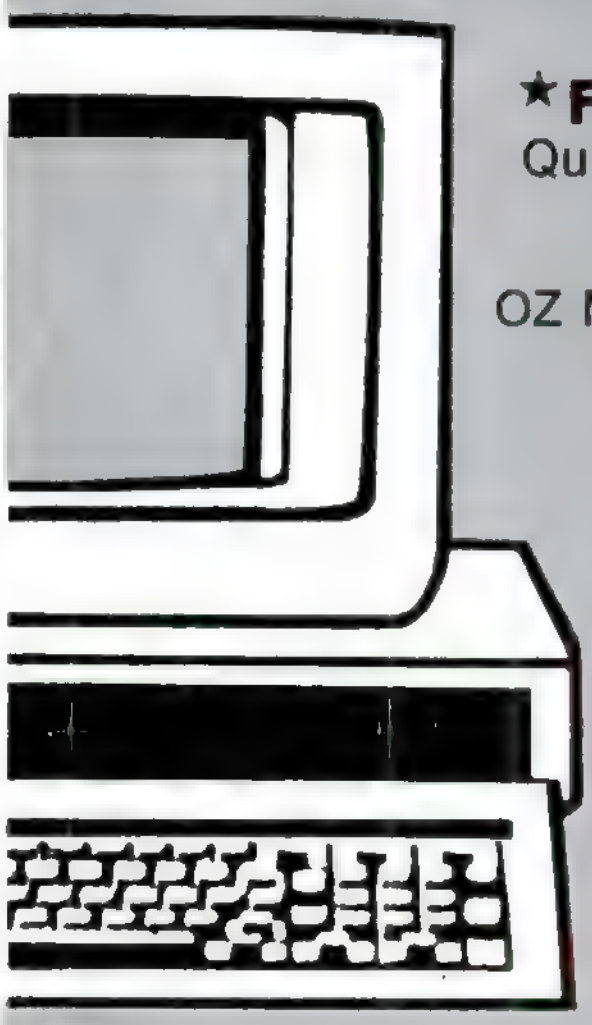
LIVING VIDEOTEXT
Think Tank *(requires 256K)* . . **134.00**

MICRO DATA BASE SYSTEMS
Knowledge Man **299.95**

MICRO PRO
Wordstar Professional includes Wordstar, Mailmerge, Correctstar, Star Index and Training Disk **359.95**
Wordstar 3.3 . . . . . **259.95**
Infostar **239.95**

for PC as EZ as ABC.

from 47th St. Computer



★**FOX & GELLER**
Quick Code with DUtil
$179.95
OZ Management Control
$219.95

★**ASHTON TATE**
Dbase II
Version 2.4
with Tutorial
$329.95
LIMITED SUPPLY

for other specials!

- *No surcharge for credit cards.*
- *Prompt and efficient service.*
- *Extensive inventory of PC products.*
- *Knowledgable and experienced sales staff.*

We stock an extensive inventory on IBM PC® , XT® , Apple® , Franklin® , Kaypro® , Compaq® , Hyperion® , Columbia® , Olivetti® , Eagle® , etc.

MICRORIM
Rbase 4000 *(requires 256K)* . 319.95
Extended Reportwriter 96.50
Clout 139.00

MICROSOFT
Multiplan 129.95
Macro Assembler 69.50
C. Compiler 329.00
Word w/Mouse - Version 1.1 . 289.95
Word - New Version 239.95
Fortan Compiler 224.95
MS PASCAL Compiler 194.95

MICROSTUF
Crosstalk XVI 99.00

MONOGRAM
Dollars & ene 104.00

OPEN SYSTEMS ACCOUNTING
256K req.
General ledger 439.00
Accounts receivable 439.00
Accounts payable 439.00
Payroll 439.00
Inventory 439.00
Sales order processing 439.00
BI-286-D required to run 149.95

SAVE!!!* Order 3 or more Open System accounting modules at once and deduct $10.00 per module *(BI-286-D not included)

OSPREY ACCOUNTING SOFTWARE
General ledger 219.00
Accounts receivable 219.00
Accounts payable 219.00
Inventory 219.00
Sales invoicing 219.00

PBL CORP
Letterform 1000 DOS 1.1 . . . . . 64.00
Letterform 1000 DOS 2.0 . . . . . 64.00
Personal Investor 124.00

PC SOFTWARE
PC Crayon 29.95
Executive Picture Show 124.95

PETER NORTON
Norton Utilities 49.95

PROFFESIONAL SOFTWARE
Word Plus PC with BOSS . . . 309.95

ROSE SOFT
Prokey 3.0 . . . . . 84.00

SOFTSTYLE
SET-FX (for Epson printers) . . 49.95

SOFTWARE PRODUCTS
Open Access *(requires 256K/color card)* 379.95

SOFTWORD SYSTEM
New Version! Multimate 269.95

SOFTWARE PUBLISHING
PFS File 89.95
PFS Report 79.95
PFS Graph 89.95
PFS Write 89.95

SOFTWARE ARTS
TK Solver 259.00
Financial Management 70.00
Mech. Engineering 70.00

SSI
Word Perfect with Speller . . . 269.95

SORCIM
Supercalc³ 229.00

SUMMA SOFTWARE CORP
Traders data manager 139.95
Traders forecaster 179.00
Traders accountant 254.00

Complete system includes above 3 . . . . . 495.00
(A modem and Dow Jones Password required)

VISICORP
VisiCalc 4 . . . . . 179.00
VisiWord Plus 239.00
VisiFile 179.95
Visi Trend/Plot *(requires color card)* 179.00

VM COMPUTING
Relay communication software 99.00

Remember Our Name — It's all the Memory You Need.

47st. Computer
Computers and Business Equipment®

A Division of 47st. Photo Inc.

67 W. 47th St. • 115 W. 45th St.
New York, N.Y. 10036

Mail Order Address:
36 E. 19th St., N. Y., N.Y. 10003

212-260-4410

TOLL-FREE OUT-OF-STATE 800-221-7774

STORE HOURS:
Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, AX, M. O. Immediate shipment for personal checks cleared by our check approval service. Defective software will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the time warranty packed with product. Items returned must be sent to 32 E. 19 St., N. Y., N.Y. 10003, Att: Returns Dept. Min. shipping and handling fee $5.50. Prices herein are for mail and phone orders only and subject to change without notice. Store prices may differ. Some items are subject to availability.

For the latest items on the market and up-to-date sale prices check our weekly ads in the National editions of the N.Y. Times and WSJ.

IBM® is a registered trademark of International Business Machines Inc.

CIRCLE 112 ON READER SERVICE CARD

COMPUCLASSICS

INCREDIBLE PRICES WITH PROFESSIONAL SUPPORT

SOFTWARE

ASHTON TATE
DBASE 11 ..... $289
DBASE 111 389
FRIDAY 169

CONTINENTAL SOFTWARE
HOME ACCOUNTANT PLUS 85
PROPERTY MANAGEMENT 319

DIGITAL RESEARCH
C BASIC COMPILER 360
PASCAL MT + ... 360
C 209

LOTUS DEVELOPMENT
1-2-3 309

MICROPRO
INFOSTAR 239
WORDSTAR 235
WORDSTAR PRO-PAC 345
MAILMERGE 129
CORRECTSTAR 129
PLANSTAR 289

MICROSOFT
MULTIPLAN 125
WORD 239
WORD AND MOUSE 299
BASIC COMPILER 249
PASCAL COMPILER 249
FORTRAN COMPILER 249
BASIC INTERPRETER 249

MICRORIM
R BASE 4000 289
EXTENDED REPORT WRITER 89

MONOGRAM
DOLLARS AND SENSE 109

SATELLITE SOFTWARE INTL.
WORD PERFECT 279

SOFTWARE PRODUCTS INTL.
OPEN ACCESS 379

SORCIM
SUPERCALC II 159
SUPERCALC III 229

SOFTWORLD SYSTEMS
MULTIMATE 289

SOFTWARE PUBLISHING
PFS REPORT $69
PFS FILE (IBM) 85
PFS FILE (APPLE) 69
PFS GRAPH (IBM) 85
PFS GRAPH (APPLE) 69
PFS WRITE (IBM) 85
PFS WRITE (APPLE) 69

LEADING EDGE SOFTWARE
WORDPROCESSOR 89
WORDPROCESSOR/MERGEPRINT 130
NUTSHELL 275

WOOLF SOFTWARE
MOVE-IT 85

MICROSTUF
CROSSTALK 109
INFOSCOPE 125

PEACHTREE
PEACH PAK 4 229
PEACH TEXT 5000 229

HARDWARE

HAYES
SMARTMODEM 300 205
SMARTMODEM 1200B 409
SMARTMODEM 1200 489

HERCULES GRAPHICS CARD
..... 349

MICROSOFT
64K RAM CARD 235
256K RAM CARD 359

C.ITOH
PROWRITER 8510 339
PROWRITER 1550 619
STARWRITER 40CPS 1100

STAR MICRONICS
GEMINI 10X 285
GEMINI 15X 419

AST RESEARCH
MEGAPLUS 64K 275
SIX PAC PLUS 64K 275

OKIDATA
MICROLINE 82A 329
MICROLINE 92 469
MICROLINE 93 785

- CORPORATE ACCOUNTS WELCOME.
- WE ACCEPT VISA & MASTER CHARGE.
- NO CREDIT CARD SURCHARGE.
- FREE TECHNICAL SUPPORT.
- CALL FOR OTHER SOFTWARE & HARDWARE PRICES.

HOURS
ORDER DESK & TECHNICAL SUPPORT OPEN
8AM - 6PM MONDAY THRU FRIDAY
10AM - 2PM SATURDAY

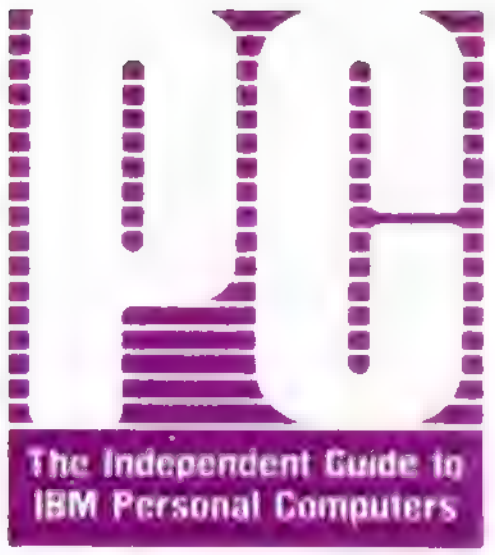
6860 CANBY ST. (SUITE 109)
RESEDA, CA 91335
TLX 292415 KET UR

SHIPPING
$4 per item UPS surface ($8 for Blue Label): printers $25

TO ORDER CALL:
1-800-328-4473 or (818) 705-1895 (CA.)

TERMS
ALL prices subject to change. We honor Cashiers Cheque/MO/Bank transfers immediately. Allow time for company & personal cheques to clear. California residents add sales tax

CIRCLE 205 ON READER SERVICE CARD



Void after October 30, 1984

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275
276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525
526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575
576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600
601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625
626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 659 650
651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675
676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700
701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725
726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750
751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775
776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800
801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825
826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850
851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875
876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	Own	*Plan to Buy*
IBM PC	A	G
IBM XT	B	H
PC*jr.*	C	I
3270 PC	D	J
XT/370	E	K
Other (specify)	F	L

2 For what, if any, business application(s) do you use the microcomputer you currently own?_____

PLEASE PRINT CLEARLY—Use only one card per person.

NAME_____ PHONE NO. (_____)_____

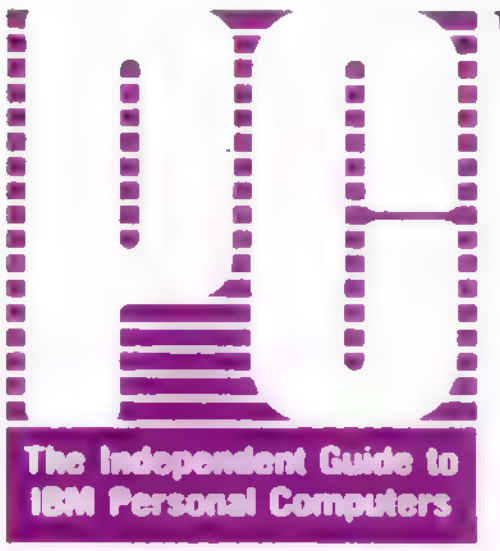
COMPANY_____ TITLE_____

ADDRESS_____ APT.____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery.) PC7/24-2

4 ☐ **Please send me 1 year (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**



Void after October 30, 1984

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125
126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150
151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175
176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225
226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250
251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275
276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325
326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350
351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425
426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450
451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475
476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500
501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525
526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550
551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575
576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600
601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625
626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 659 650
651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675
676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700
701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725
726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750
751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775
776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800
801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825
826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850
851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875
876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900

1 Please indicate which of the following microcomputers you currently own and/or plan to buy in the next 12 months.

	Own	*Plan to Buy*
IBM PC	A	G
IBM XT	B	H
PC*jr.*	C	I
3270 PC	D	J
XT/370	E	K
Other (specify)	F	L

2 For what, if any, business application(s) do you use the microcomputer you currently own?_____

PLEASE PRINT CLEARLY—Use only one card per person.

NAME_____ PHONE NO. (_____)_____

COMPANY_____ TITLE_____

ADDRESS_____ APT.____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery.) PC7/24-1

4 ☐ **Please send me 1 year (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



™

P.O. BOX 13848
PHILADELPHIA, PA 19101

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



™

P.O. BOX 13848
PHILADELPHIA, PA 19101

PC Product Index

RS#	PRODUCT	ADVERTISER	PAGE#

ACCOUNTING SOFTWARE

260	Business software	H & E Computronics	382
	Multiplan	Microsoft	44-45
467	Sensible Solutions	O'Hanlon Computer Systems	64

INTEGRATED ACCOUNTING PACKAGES

263	Integrated accounting packages	Macola Inc.	338

COMMUNICATIONS SOFTWARE

326	Crosstalk	Micro Stuff	265
454	Liasion	Softech Microsystems	1
182	The Odd Couple	Rouge River Software	328

TERMINAL EMULATORS

185	Dater Talker	Winterhalter	61
166	E M 100	Diversified Computer Systems	338

OTHER UTILITIES

127	Batchtools	Morning Star Systems	260
131	Xeno Copy	Vertex Systems	374

FINANCIAL PLANNING SOFTWARE

132	Micro PROPHIT	V I A Computer	11
306	Sideways	Funk Software	76

GRAPHICS SOFTWARE

134	Energraphics	Enertronics Research Inc.	85
181	Graphics Software	Micrografx	80
309	V C N Execuvision	Prentice-Hall Inc.	8-9

INFORMATION MANAGERS

133	File Connection	Flagstaff Engineering	94
238	File Plan	Chang Labs	308-309

PROJECT MANAGERS

451	Pro-ject 6	Softcorp	98

RS#	PRODUCT	ADVERTISER	PAGE#

SOFTWARE FOR PROFESSIONALS

493	It's My Business	Quest Research	29
120	Northeastern Software	Northeastern Software	297
	Sidekick	Borland International	18-19

ENGINEERS/SCIENTISTS

523	CAD Plan	Personal Cad Systems	220
33	8087 Chip	Microware	92

STATISTICAL SOFTWARE

222	P.C. Statistician	Human Systems Dynamics	357
412	Statistical Software	Quant Systems	331

WORD PROCESSING SOFTWARE

170	Black & White	Chelsea Syke	380
136	Display Write	IBM-PC Division	24-25
	Multimate	Multimate International	304-305
357	Office Writer	Office Solutions	26
117	Textra	Ann Arbor Software	32
133	Word Connection	Flagstaff Engineering	94
149	Word Perfect	Satellite Software	10

WORD PROCESSORS

374	Word Plus-PC	Professional Software	23

WORD PROCESSING AIDS

382	Star Polish	T D I	78
253	Set F X +	Softstyle	298

MULTIFUNCTION SOFTWARE

138	Asher	Wilcom Software	279
534	Aura	Softrend	2-3
372	Data Plus-PC	Professional Software	21
184	Fridays	Ashton-tate	106
190	MS—DOS Software	Unipress Software	365
	Smart Sofware	Innovative Software	48A-F
458	VanPak Center	Software Strategies	47

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
DEMONSTRATION SOFTWARE			
	Demonstration Software	Preview Publishing	104-105
TRAINING SOFTWARE			
109	A Typing Teacher	Individual Software	63
LANGUAGES			
126	Prolong Language Interpretor	Programming Logic Systems	367
COMPILERS			
202	Modula - 286	Logitech	290
	Turbo Pascal Borland Compiler	Borland International	43
INTERPRETERS			
276	P C Forth	Laboratory Micro	250
PROGRAMMER'S TOOLS			
452	B trieve	Softcraft	245
823	d Programer	Sensible Designs	86
DATA BASE MANAGERS			
106	D I 100	C D I 100	362-363
300	Condor Jr.	Condor Computer Corp	C-2
108	Data Flex	Data Access Corporation	74
209	d Base III	Ashton-Tate	224-225
493	It's My Business	Quest Research	29
111	PC File 'N Report	Jaspir International	359
160	Powerbase	Powerbase Systems	288-289
127	Protools	Morning Star Systems	260
152	Revelation	Cosmos Inc	70
PROGRAM DEVELOPER/GENERATOR TOOL			
125	Basic-C	C Source	359
525	Knowledge Man	MDBS	164-165
150	Tools	Blaise Computing	262

RS#	PRODUCT	ADVERTISER	PAGE#
SORT/MERGE TOOLS			
192	Sort/Merge Tools	Computer Control	380
TEXT EDITORS			
182	SPF/PC	Rouge River Software	398
117	Textra Jr.	Ann Arbor Software	32
OTHER UTILITIES			
158	Copywrite	Quaid Software LTD.	331
340	Disc Mechanic	MLI Microsystems	338
487	J Format	Tall Tree Systems	360
119	Nice Print	Spies Labs	146
346	Power utilities	Norton Utilities	337
252	Smart Key II	Software Research Technology	17
HARDWARE			
375	Tava Capital Letters	Tava	237
211	XPC	XDS Manufacturing	334
IBM COMPATIBLE COMPUTERS			
370	IBM PC Compatible	Seequa Computer Corp.	53
341	Televideo PC	Televideo Systems Inc.	108-109
ACCESSORY CARDS			
251	Quadcolor	Quadram Corp.	38
250	Quadvue	Quadram Corp	22
MULTIFUNCTION BOARD			
802	Accelerator PC	Titan Technologies	376
334	AST Boards	Qubie Distributing	110
516	Baby Blue II	Microlog	273
12	Blossom	Orchid Technology	207
512	Family Multifunction	Persyst	152-153
501	Mulufunction Board	Tecmar	142-143
123	PC Turbo	Orchid Technology	205
171	PC Vision	Imaging Technology	276
437	Sandstar Cards/Modules	Maynard Electronics	138
101	Six Pac Plus	AST Research	82-83
207	Ultrapack	Tseng Labs	56



NOW AVAILABLE— THE MASTER DIRECTORY OF PRODUCTS FOR YOUR IBM PC

Nearly 400 pages of the most current listings and information for IBM PC, PC XT, PCjr and compatible hardware, software, accessories and services—from the publishers of PC.

YOUR PRIMARY REFERENCE...

organizing over 4,000 products and 1,500 vendors, services, and support systems in one comprehensive, easy-to-use guide. PC: THE BUYERS GUIDE is the quickest and most reliable way to locate exactly what you need to expand the usefulness of your personal computer.

Because it's published quarterly in May, August, November and February, PC: THE BUYERS GUIDE is the most up-to-date guide of its kind, accurately describing each product and its function and cost. Find out what level of skill is required to get the most from the product *and everything is logically categorized and indexed with cross-references so you won't miss one listing!*

GET MORE FROM YOUR PC

The documentation you received from IBM is only the beginning. Finding the *right* hardware and software is what really makes the difference in how effectively your IBM or compatible PC performs—that's why you need PC: THE BUYERS GUIDE! You'll also find detailed listings for the following important services and accessories:

- Consultants
- On-line Bulletin Board Databases
- Furniture
- Retail and Mail Order Outlets
- Literature
- User Groups
- Insurance Services
- Professional Societies
- Retail Clubs
- Computer Groups
- Maintenance services

AND MUCH MORE!

Be sure to order your copy of PC: THE BUYERS GUIDE today—fill out the coupon and mail it now!

PHONE TOLL FREE 9 am-5 pm EST:
1-800-526-0790
(In New Jersey 201-540-0445)

ALSO AVAILABLE AT YOUR LOCAL NEWSSTAND AND COMPUTER STORE

THE BUYERS GUIDE NY1F

CN1914, Morristown, NJ 07960

Please send me PC: THE BUYERS GUIDE. Enclosed is $9.50 ($7.95* per copy, plus $1.55 each for postage and handling.) ($11.00 outside USA, send US funds only). *Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ and NY State add applicable sales tax.

Charge My:
☐ American Express ☐ Visa ☐ MasterCard

CARD NO _____ EXP DATE _____

MR./MRS./MS. _____ print full name

ADDRESS _____

CITY/STATE/ZIP _____

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
VIDEO/GRAPHICS BOARD			
502	Graphics Master + The Nes Captain	Tecmar	C-4
430	Graphics Plus	STB Systems	C-3
	Hercules Color Card	Hercules Computer Technology	5
	Hercules Graphics Card	Hercules Computer Technology	59
103	Monograph Plus	AST Research	274
OTHER ACCESSORY CARDS			
148	Disc Drive	Micro Design	177
487	J Ram	Tall Tree Systems	360
EXPANSION UNITS			
168	Memory Expansion Kits	Jameco Electronics	359
INPUT HARDWARE			
342	Disk Drive	Mitsuba	368
INTERFACE DEVICES			
210	Hard Disk Controller	Zobex	244
	Print Spooler	Apparat, Inc.	248
110	SCSI	Innovative Data Technology	166
MASS STORAGE HARDWARE			
396	Beta Plus	R.P. Marketing Corp.	84
445	Cartridge Tape/Hardfile System	Tall Grass Technologies	27
102	Combo Board/Ram/Harddisk	Apparat	249
186-187	Disc Drive	Interface Inc.	16
497	Q 450 Streamertape + Backup	Quentin Research	328
327	Quadisk	Quadram	12-13
219	Tape Backup System	Davong Systems	14
MODEM			
448	Password	U.S Robotics	253
464	1200 plus	Ven-Tel	28
227	Qubie Modem Card	Qubie Distributing	68-69
NETWORKING			
185	Data Talker	Winterhalter Inc.	61
104	PC Networking	AST Research	275

RS#	PRODUCT	ADVERTISER	PAGE#
OTHER COMMUNICATIONS HARDWARE			
444	Irma + Irmaline	Digital Communications Associates	30-31
DISPLAY/MONITORS			
188	Display Monitors	Taxan	102
342	Monitor	Mitsuba	368
299	PGS	Princeton Graphics Systems	268
PRINTERS			
208	Brothe HR-25	Dynax	20
285	Okidata Printer	Okidata	168
342	Printer	Mitsuba	368
DOT MATRIX			
118	D.S. 220	Data South	97
PRINTER DRIVERS			
316	Printer Boss	Connecticut Software	293
DISKETTE			
229	Amagasaki Diskettes	Compusa	331
154	Diskettes	Precision Data Products	331
	Diskettes	The Diskette Connection	331
PRE-PRINTED FORMS			
	Prom Blaster	Apparat, Inc.	248
OTHER SUPPLIES			
	Accessories	Curtis Manufacturing	373
141	Data Saver	Cuesta Systems	374
196	Dust covers	Contemporary Computerware	338
172	Dust Covers/Visual Enhancement Screen	Compucable	356
167	Printer Switch	Intra Computer	343
383	Qubie Keyboards	Qubie Distributing	256
ORGANIZATIONS AND SERVICES			
226	Computer Information Network	Compuserve	101
	Computer Insurance	Safeware	127

The publisher does not assume any liability for errors or omissions in the product index.

We promise to tell the truth the whole truth and nothing but the truth. So help us BPA.

As a member of BPA (Business Publications Audit of Circulation, Inc.) this magazine subscribes to the principle that it takes more than good faith to earn the business of advertisers. It takes good figures.

BPA, an independent, not-for-profit organization, audits our circulation data to make sure that advertisers get exactly what they pay for: you.

Once a year, BPA auditors examine our circulation list to make sure it's correct and up to date.

The audit makes sure you are who we say you are. It verifies your name, your company, your industry and your job title. This information enables our advertisers to determine if they're saying the right thing to the right people in the right place.

It also gives us a precise picture of who you are and, therefore, a good idea of what you want as a reader.

BPA. For readers it stands for meaningful information. For advertisers it stands for meaningful readers. Business Publications Audit of Circulation, Inc.
360 Park Ave. So., New York, NY 10010.

BPA

We make sure you get what you pay for.

NEW – IBM PC VISUAL ENHANCEMENT SCREEN AND DUST COVERS



See what you read without fatigue!

Visual enhancement screen...
- reduces eye fatigue by eliminating reflection and glare
- has a handy pull-out tab for easy removal
- foam gasket assures a perfect fit



Protect your PC!

PC dust covers...
- provide protection from dirt, dust and smoke
- are custom designed for the IBM PC disk drive and keyboard
- manufactured with a smoke colored acrylic finish

COMPUCABLE CORPORATION

Developing, manufacturing, and distributing

For more information call

800/521-7903

except in California, Alaska and Hawaii call

714/635-7330

DEALER INQUIRIES INVITED

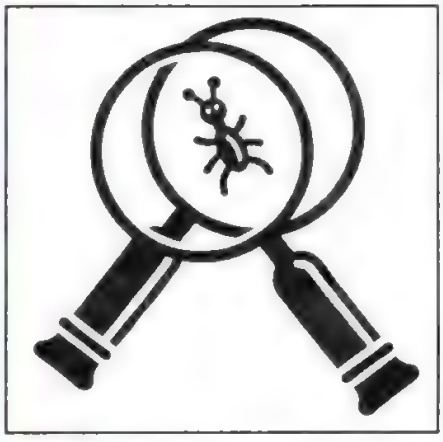
*FOR MONOCHROME MONITORS ONLY – SCREENS FOR COLOR MONITORS WILL BE AVAILABLE SOON.

© COMPUCABLE CORPORATION 1984

CIRCLE 172 ON READER SERVICE CARD

User-to-User

PC readers use this forum to help one another by passing along their questions, solutions, comments, and complaints.



Out the Window

The routine in Figure 1 allows the user to selectively scroll a rectangular window anywhere on the screen. The coordinates of the upper left corner and the lower right corner of the window must be specified by integer variables. The number of lines to be scrolled must also be defined by an integer variable. If the number of lines is specified as zero, the window will be cleared in the current background color.

In Figure 1, lines 260 through 570 are the scroll routine. The demonstration program consists of lines 120 through 200. The effect of this program is to clear a selected window on the screen and print a string that is scrolled upwards by two lines. This process is repeated continuously. A small time delay loop is provided to slow down the printed strings upward movement.

The scroll routine is a machine language routine that makes use of the ROM BIOS to interact with the screen. The routine itself is embedded in the string variable P$ and may be located anywhere in memory, as there are no absolute coding references. BASIC uses the VARPTR command to determine the address at which the embedded string is located. This address is then assigned to the integer variable SCROLL%. The arguments for the CALL statement must specify the upper left window coordinates, the lower right window coordinates, and the number of lines to be scrolled in the same order as stated. If the value of the number of lines is zero, the window will be cleared. If the main program using the routine has extensive string manipulation, it is possible that the string buffer will become full. At this point BASIC frees up the "garbage" strings by relocating all current strings to sequential locations in the string buffer. This would cause the reference address pointing to P$ to be altered. For this reason all calls to the SCROLL subroutine should update the reference address to the embedded machine language routine. See Figure 2 for a machine-code version.

David A. Schultz
Calgary, Alberta

(continued)

```
100 ' WINDOW -- Scrolling program by David A. Schulz
110 '
120 COLOR 0,10:CLS:COLOR 10,0                 'set window to black background
130 GOSUB 260                                 'set up mach language scroll routine
140 N%=0:GOSUB 460                            'clear window; N% is normally the
150 A$="01234567890123456789012345678901"     'number of lines to scroll
160 GOSUB 590                                 'scroll window up 2 lines
170 LOCATE 21,10:PRINT A$
180 C$=LEFT$(A$,1):A$=MID$(A$,2):A$=A$+C$     'rotate string to the left
190 GOSUB 350                                 'delay to slow down scrolling
200 IF INKEY$="" THEN 160 ELSE END            'do it again
210 '
220 '*************************************************************************
230 'the following routine can scroll or clear a rectangular window anywhere
240 '*************************************************************************
250 '
260 P$=""
270 RESTORE 560
280 '
290 '----- pack the string with the machine language routine ----------------
300 FOR I=1 TO 28
310 READ A
320 P$=P$+CHR$(A)
330 NEXT
340 '
350 '----- set the segment pointer to BASIC ---------------------------------
360 DEF SEG
370 '
380 '----- determine the location of the machine language subroutine -------
390 S!=PEEK(VARPTR(P$)+1)+PEEK(VARPTR(P$)+2)*256
400 IF S!>32768! THEN SCROLL%=S!-65536! ELSE SCROLL%=S!
410 '
420 '----- specify the number of rows to scroll up -------------------------
430 N%=&H2
440 '
450 '----- specify the upper left coordinates:   row=9   column=9 ----------
460 LX=&H909
470 '
480 '----- specify the lower right coordinates:  row=20  column=39 ---------
490 RX=&H1427
500 '
510 '----- scroll up the screen --------------------------------------------
520 CALL SCROLL%(LX,RX,N%)
530 RETURN
540 '
550 '----- machine language data -------------------------------------------
560 DATA 85,139,236,139,118,6,139,4,139,118,8,139,20,139
570 DATA 118,10,139,12,183,7,180,6,205,16,93,202,6,0
580 '
590 FOR A=1 TO 100:A=A:NEXT:RETURN
```

Figure 1: *Window-scrolling routine.*

```
PUSH    BP              ;SAVE REGISTER ON STACK.
MOV     BP,SP           ;SET POINTER TO TOP OF STACK.
MOV     SI,[BP+6]       ;GET ADDRESS OF FIRST VARIABLE
                        ;SAVED ON STACK BY BASIC.
MOV     AX,[SI]         ;GET THE VALUE OF THAT VARIABLE
                        ;AND SAVE IN AX REGISTER.
MOV     SI,[BP+8]       ;GET THE ADDRESS OF THE LOWER
                        ;RIGHT CORNER OF THE WINDOW.
MOV     DX,[SI]         ;SAVE THE VALUE IN DX REGISTER.
MOV     SI,[BP+0AH]     ;GET THE ADDRESS OF THE UPPER
                        ;LEFT CORNER OF THE WINDOW.
MOV     CX,[SI]         ;SAVE THE VALUE IN CX REGISTER.
MOV     BH,07           ;SET MODE FOR THE BIOS ROUTINE.
MOV     AH,06
INT     10              ;CALL THE BIOS SCROLL ROUTINE.
POP     BP              ;RESTORE THE BP REGISTER.
RET     6               ;GET THE RETURN ADDRESS OFF THE
                        ;STACK BY IGNORING THE DATA
                        ;PLACED ON THE STACK BY BASIC.
```

Figure 2: *Machine language version of the window-scrolling routine in Figure 1.*

NEW

PC STATISTICIAN™

A POWERFUL, NEW STATISTICS PACKAGE FOR THE IBM PC

Are you tired of complicated data input and analysis specification on mainframes? Do you need data management, reports, statistics on unlimited cases? Are you ready to do professional statistics in your own office within minutes?

Let **PC STATISTICIAN**™ do the work for you

EASY TO USE

PC STATISTICIAN™ is flexible and sophisticated, yet simple to use. Follow the examples in the manual, then start analyzing experimental or survey data immediately

CHOOSES CASES AUTOMATICALLY

To get reports on your data, specify the analysis, then the variables and variable levels. If you have all of your data in a single file, **PC STATISTICIAN**™ can choose the records and variables for your analysis automatically. It even handles missing data automatically

COMPREHENSIVE

You will be able to carry out virtually all of your data analysis with this one package. **PC STATISTICIAN**™ includes

Research data base
Search & select on 1-4 variables
Crosstabulation on 1-5 variables
Descriptive statistics
Frequency distribution
T-tests
1-way anova
Nonparametrics
Correlations
Curvefitting
Multiple regression
Contingency tables
Data transformations
Graphics

PC STATISTICIAN™ comes with a 10 day money back guarantee. This is the first program in The Statistics Series™ for the IBM PC. IBM PC, PC DOS, 128K, 2 DSDD Disk Drives. **$300.00**

CIRCLE 222 ON READER SERVICE CARD

HSD
HUMAN SYSTEMS DYNAMICS

To Order—Call
Toll Free (800) 451-3030
In California (818) 993-8536
or Write
HUMAN SYSTEMS DYNAMICS
9010 Reseda Blvd. Suite 222/Dept. P
Northridge, CA 91324

Dealer Inquiries Invited

MENU FOR YOUR EPSON

Now you can have full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Printer Boss**™ software lets you send all of the complicated control codes, in seconds, by making menu selections with a few simple keystrokes.

Select and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different type faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. Create ASCII files of data, corresponding to the stored menu settings, which can be accessed by or included in your own programs to set up the printer as required. **Emulate** the IBM-label printer for the IBM-PC, eliminating printout problems with IBM-PC software and Epson FX printers. **Download** to FX printers five different **IBM character sets,** including graphics, screen and APL characters and greek symbols. Print two-pass **letter quality** on your FX at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. Print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, in a choice of five different type sizes. Or create a **printer buffer** of up to 32K. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS. A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 317 ON READER SERVICE CARD

A handy program. You can experiment with incorporating the lower half of the routine (lines 260–570) in your own BASIC programs for special graphics effects.

...To the Rescue

Now that I've had my PC for a couple of years, I've collected so many useful programs that I'm beginning to lose track of them all. So I sometimes need to keep a few notes on seldom-used programs.

Most mainframe computers offer what is called a help facility. By typing the word Help, optionally followed by a program name, the user gets a quick how-to on the requested program.

Here are two methods for creating a help utility for your PC:

1. First, make a disk file of your directory by typing:

```
DIR >DIR.HLP
```

Then, using a word processor, add comments to the DIR.HLP file to the right of each entry. (See Figure 3 for a sample.)

The scroll routine is a machine language routine that makes use of the ROM BIOS to interact with the screen.

Finally, make a batch file called HELP.BAT that says:

```
TYPE DIR.HLP | MORE
```

This method works, but it limits the amount of notes you can squeeze alongside your directory in DIR.HLP. Also, you must edit or remake DIR.HLP when your directory changes.

2. I prefer the following method

```
 Volume in drive A has no label
 Directory of  A:\

COMMAND  COM     17664   3-08-83  12:00p
PRT40    CTL        21   9-03-82           For 40-column screen
PRT80    CTL        17   8-27-82           For 80-column screen
DOC      BAT       330  10-17-82   4:20p  Prints PC-FILE.DOC
PC-FILE  DOC     61440   3-05-83  10:26p
PRT      CTL        39   2-11-83   4:44p  See PC-FILE.DOC for expl.
AUTOEXEC BAT        20   1-01-80  12:01a
PC-EXPOR EXE     17920   3-04-83   6:40p
PC-FILE  EXE     44672   3-04-83   6:10p
PC-SORT  EXE     24960   3-05-83   9:37p  Called from PC-FILE
CLOCK-ON COM       813   9-18-82           Sets clock from battery
       11 File(s)    124928 bytes free
```

Figure 3: *Sample DIR.HLP file created by redirecting the directory into a file, then adding comments with a word processor.*

```
echo off
cls
if %1==SUBJECTS goto subjects
if %1==subjects goto subjects
if not exist %1.hlp goto nofile
copy %1.hlp con
goto endbatch
:subjects
dir *.hlp
goto endbatch
:nofile
echo Type  HELP followed by the file name (or HELP * for all).
echo Type  HELP SUBJECTS for a list of available topics.
:endbatch
```

Figure 4: *HELP.BAT batch file.*

IBM-PC COMPUTER SOFTWARE

Announcing

Price Only $195.00

PC-FILE 'N REPORT™

The ultimate computer program which will handle all your Filing and Data-Management needs such as:

- Medical Records
- Payroll
- School Records
- Reminders
- Accounts Payables
- Accounts Receivables
- Checkbook Balancing
- Record your Thoughts
- Inventory
- Family Finance
- Events
- Write Letters
- Budgets
- Mailing Lists
- Appointments
- Write Memos

Available for **IBM Personal Computer, PC Jr.** and many compatible computers. Call for free brochure and name of Dealer nearest you.

JASPIR International, Inc.
24 Salrit Avenue
Waldwick, NJ 07463 *Dealer/Distributer Inquiries Welcome*
(201) 445-8535

IBM-PC COMPUTER SOFTWARE

CIRCLE 111 ON READER SERVICE CARD

SAVE HUNDREDS OF $$$ BY UPGRADING MEMORY BOARDS YOURSELF!

INTRODUCING...

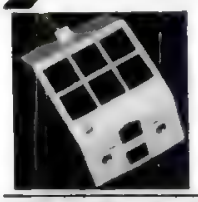
IBM MEMORY EXPANSION KIT COMPAQ COMPATIBILITY

Most of the popular memory boards allow you to add an additional 64K, 128K, 192K, or 256K. The IBM64K Kit will populate these boards in 64K byte increments. The kit is simple to install – just insert the nine 64K RAM chips in the provided sockets and set the two groups of switches. Directions are included.

IBM64K (Nine 200ns 64K RAMs). $49.95

INDUSTRIES

Protect Yourself...



DATASHIELD® Surge Protector

Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. Six month warranty. Power dissipation (100 microseconds): 1,000,000 watts

Model 100. . . . . $69.95

DATA SHIELD® Back-Up Power Source also available. Provides up to 30 min. of continuous 120VAC 60Hz power to your computer system (load dependent) when you have a black-out or voltage sag. Also eliminates voltage surges and unwanted noise.

PC200. . . . . $349.95

$10.00 Minimum Order — U.S. Funds Only
California Residents Add 6½% Sales Tax
Shipping — Add 5% plus $1.50 Insurance
Send S.A.S.E. for Monthly Sales Flyer!

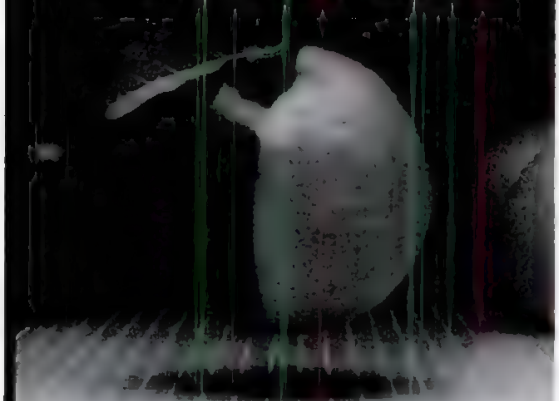
Spec Sheets — 30¢ each
Send $1.00 Postage for your FREE 1984 JAMECO CATALOG
Prices Subject to Change

MasterCard Jameco ELECTRONICS VISA

6/84 1355 SHOREWAY ROAD, BELMONT, CA 94002
Phone Orders Welcome (415) 592-8097 Telex: 176043

CIRCLE 168 ON READER SERVICE CARD

NOW YOU CAN WORK IN C WITH ONLY BASIC KNOWLEDGE



Enjoy the Best of Both Worlds with BASIC_C™!

Write or Call Collect

C SOURCE

C Source
12801 Frost Rd.
Kansas City, MO 64138
816-353-8808

Until now, IBM BASIC and C were about as far apart as apples and oranges — and if you wanted to move from BASIC to C, you had to go back to square one. Not anymore!

There's no denying that BASIC is a fine language: it has probably helped you learn a lot about programming computers. But now that you know how to program, isn't it time to take the next step — to a language that was designed to help you quickly develop software that is fast, compact, and portable?

BASIC_C can help you make the transition smoothly: it's a library of C functions providing BASIC's high level capabilities you've come to know so well. Functions for string handling, sequential and random i/o, graphics, and many more — all designed to look and work like BASIC.

You get the source code to BASIC_C: extensively documented, it provides many examples to help you learn how to write C functions, and if a function doesn't happen to suit your specific needs . . . change it!

C Source provides a complete development package: the BASIC_C Library, a full screen editor, and a choice of three C compilers. Buy it all, or just the pieces you need.

BASIC_C Library - source code	$175
EC - full screen editor	$ 85
BASIC_C & EC	$225
BASIC_C & DeSmet C Compiler	$275
BASIC_C & Computer Innovations C compiler	$475
BASIC_C & Lattice C compiler	$550
BASIC_C, DeSmet C Compiler, & EC	$325
BASIC_C, Computer Innovations C compiler, & EC	$525
BASIC_C, Lattice C compiler, & EC	$600

CIRCLE 125 ON READER SERVICE CARD

TALL TREE SYSTEMS

INTRODUCING

JRAM-2

THE ONLY TWO MEGABYTE MULTI-FUNCTION BOARD

Break through the 640K-byte memory barrier! Put two MEGABYTES of RAM *plus* all the most popular I/O functions—serial ports, parallel ports, and clock/calendar—in a single PC slot! Includes JETDRIVE RAM disk and JSPOOL printspooler.

JRAM-2 OPTIONS

JRAM-2 0K $219
JRAM-2 0K, Clock/Cal $299
JRAM-2 0K, Serial, Parallel ports, Clock/Cal $399
JRAM-2 0K, Two Serial ports ...$349
JRAM-2 0K, Two Serial ports, Clock/Cal.....$399
JRAM-C (For Columbia PC) 0K, Clock/Cal $249

MEMORY

64K chips $50/Bank
256K chips $500/Bank

DOS 2.0, 2.1 SOFTWARE

JETDRIVE $60
WINDRIVE.....$60
JFORMAT-2 .....$60
JSPOOL.....$60

TALL TREE SYSTEMS
1032 ELWELL COURT, SUITE 124
PALO ALTO, CA 94303
(415) 964-1980
CIRCLE 487 ON READER SERVICE CARD

because it requires fewer files, less disk space, and allows for more extensive notes. First, create the batch file called HELP.BAT in Figure 4. Then, using your word processor (or simply by typing COPY CON: FILENAME.HLP), create files with the .HLP extension that explain each of your programs. With this batch file and your .HLP files, you can keep lots of information at your fingertips.

This method works especially well with a hard disk (which can contain so many more files)!

Edward Fischer
New York, New York

If you try the first version, remember to make sure the MORE.COM DOS file is on your disk. Again, a paean to the hard disk, the RAMdisk, and the batch file. This kind of documentation can be useful when you have a ton of similar sounding 11-letter filenames, some even months old.

Switching between screens in memory is vastly underexploited.

Free Space Checker

A recently published Assembler Language program to determine the number of bytes left on a disk meets a real need but is rather elaborate. The routine described below gives another solution. (See Figure 5.)

If you have DOS 2.0 and a color adapter card and can spare 2 to 3 seconds per operation, a simple method using BASIC will do the job. Just flip to another screen "page" without changing the visual page execute FILES, and read the bottom line. Flip back and continue the program.

J. D. M. Phelps
Crystal River, Florida

This method of switching back and forth between screens in memory is vastly underexploited. The reason is probably that you can't do it on a pure monochrome system. As color becomes more popular, so will tricks like this. Even color systems don't do much with it, which is a shame. There is room for the additional pages in memory; why not use them? They are perfect for menus, help screens, etc., and they really pop—you touch a key and the screen instantly flashes to the new page. And you can perform some pretty convincing animations with them. All you color system users out there: Send your screen page tricks to us!

Share Your Discoveries

Tell the world about your latest discovery through User-to-User, and we'll pay you $50 for your trouble, *plus an extra $25 if you submit it on a disk*. If you send a disk, please include a printout of your submission to ensure against damage in transit. Mail your contributions to: User-To-User, *PC Magazine*, One Park Avenue, New York, NY 10016. ■

```
100 ' FREEBYTE -- by J. D. M. Phelps -- determines bytes available
110 '
120 T1=TIMER:I=1
130 SCREEN 0,0,1,0:CLS
140 FILES
160 I=I+1:IF SCREEN(I,1)<>32 THEN 160
170 N=N+1
180 X=SCREEN(I,N)
190 IF X=32 OR (X>47 AND X<58) THEN B$=B$+CHR$(X):GOTO 170
200 SCREEN 0,0,0,0
210 LOCATE 24,1:PRINT VAL(B$)";bytes free"
220 PRINT TIMER-T1";seconds elapsed time
```

Figure 5: *Program to determine bytes available on your disk. Note that a color graphics card is required.*

USING?...BUYING?... UPGRADING?...

A GRAPHICS PACKAGE FOR YOUR PC

You have to create graphs and charts to tell your story. Your needs vary from financial statements and personnel benefits to inventory records...presentations are made on printouts, slides and telemonitors...and for the most part, a salesman or a representative other than yourself makes the presentation. You really need a good and simple graphics package, one that will help you tell the story, without using a lot of your valuable time.

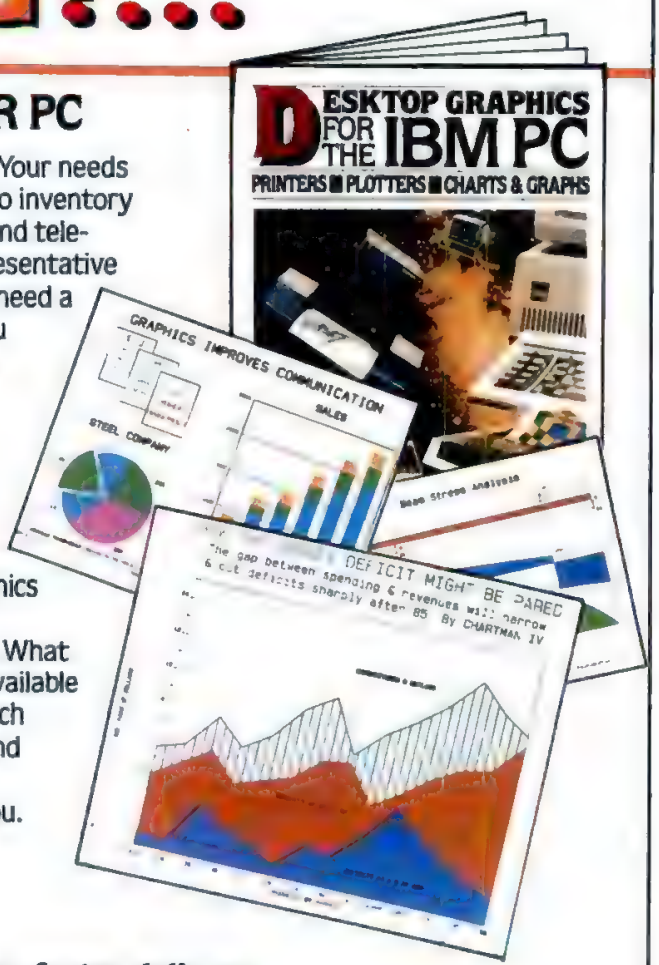
You need DESKTOP GRAPHICS FOR THE IBM PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS, the fully illustrated guide to the preparation, design and production of business graphics.

This is a book written with you in mind, the business or professional user with little technical or statistical knowledge, using or planning to purchase a graphics package.

Topics include: • What hardware options you have • What software will best meet your needs • What charts are available to you and your IBM PC • What data works best with each chart • What is the difference between a mean, mode and median • How to shoot slides directly from the screen • Visitrend - Peachtree - BPS - 1, 2, 3—what's right for you.

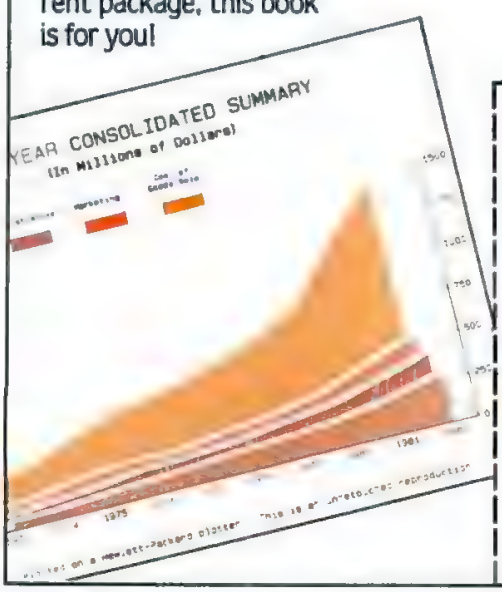
Author Corey Sandler gives you clear and non-technical introductions to graphing theory and statistics, explaining and evaluating your hardware options (including printers, plotters and monitors), plus so much more!

If you've been contemplating buying a new graphics package or just want to get more out of your current package, this book is for you!



For faster delivery,
PHONE TOLL FREE 9 am-5 pm E.S.T.:
1-800-631-8112
(In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.



CREATIVE COMPUTING PRESS

Department NW1F 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of DESKTOP GRAPHICS FOR THE IBM-PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS at $14.95* plus $2.00 postage and handling ($5.00 outside USA) each. Item #60-7.

Payment Enclosed $_____. * Residents of CA, NJ and NY State add applicable sales tax.

Charge My: ☐ AmEx ☐ MC ☐ Visa

Card No._____ Exp. Date_____

Mr./Mrs./Ms._____
print full name

Address_____

City/State/Zip_____

☐ Please send free catalog.



In the battle of wits with your computer, you now have a powerful new ally. An information management system called CDI/100.

It brings our experience in the minicomputer world to your micro, giving you a fast, powerful, flexible tool for creating, accessing and changing data base information. CDI/100 is so easy, novices can proceed with ease. And so flexible, experts can adapt and build specialized applications.

CDI/100 features include a relational data base management system—the only one you'll find with variable length fields. Plus an open-ended file structure with a recordkeeping system that is virtually limitless.

Most revolutionary of all, CDI/100 allows you to use a host of existing application programs,



so you can easily transfer files or add the programs of your choice.

To find out how you can acquire an information management system that lets you take charge fast and efficiently, ask for a test demonstration of CDI/100 wherever you buy your software.

Exceptional New Software Concept

- Everyone's Filing System
- English-like Inquiry Language
- Dynamic Menu System
- Integrated Help Features
- Relational Data Management
- Enhanced Basic Compiler
- Dictionary Supported Data Base
- Task Master

CDI 100™

CDI Information Systems, Inc.
1306 114th Ave. S.E.
Bellevue, WA 98004
(206) 455-5117

INCREASE YOUR PERSONAL POWER.™

CIRCLE 106 ON READER SERVICE CARD

CHARGE ORDERS—for your convenience,
PHONE TOLL FREE 800-526-0790. In New Jersey only 201-540-0445.

PC Poster Offer, CN 1914, Morristown, NJ 07960

Please send _____ prints of Mark McCandlish's "Inside the IBM Personal Computer" @ $10.00* each plus $2.50 postage & handling. Outside USA add $5.00 postage & handling.

☐ PAYMENT ENCLOSED $_____

☐ CHARGE: ☐ Visa ☐ MasterCard ☐ American Express

Card No._____ Exp. Date_____

Signature_____

Print Name_____

Address_____

City/State/Zip_____

*Residents of CA, CO, CT, DC, FL, IL, MA, MI, MO, NJ, NY State, and VT add applicable sales tax.

Unique Art Poster Offer—A Cutaway View of the IBM Personal Computer!

24" x 32" poster, "Inside the IBM Personal Computer" by Mark McCandlish. Printed on quality heavyweight poster stock. Only $10 plus $2.50 for postage and handling.



MARK ZACHMANN

PC Tutor

Good Old Chips

Q: I received my IBM PC in March 1982. It was one of those units with the old 8088 chip, old BIOS, single-sided disk drives, and a 16K motherboard. Since then, I've upgraded my peripherals by getting a new



printer, disk drives, and expansion boards (including graphics).

Now I wonder if I should get an updated BIOS and 8088, because I've heard that some software won't run with the old chips. Is it worth replacing them? How much would it cost?

Bruce Guthrie
Washington, D.C.

A: *There is only one significant difference between early and late 8088s: the chip's ability to work in tandem with an 8087 coprocessor chip. If you don't plan to install an 8087, it would be a waste of money to buy a new 8088. Some of the early IBM PCs, like yours, have the newer 8088 chip anyway. Also, a compatible 8088 is often included when 8087s are sold.*

As far as the BIOS is concerned, the only reason to switch chips is if you plan to install a hard disk in your PC. You'd need a ROM chip with the new BIOS to be able to boot off the hard disk. If you purchase an IBM fixed disk extension, new ROMs will be supplied with it, but I don't know of any other way to obtain the new BIOS. An add-on hard disk from a source other than IBM should include either its own new ROM or device driver software suitable for an older IBM PC (the earlier model is sometimes called the PC-1).

In summary, there's no need for you to shop for new 8088 and BIOS chips. The few upgrades in which your system would need updated chips are likely to deliver their own solutions.

Shopping for a Dump

Q: In an item titled "Okidata Graphics Dumps" (*PC*, Volume 3 Number 7, page 429), you mentioned that programs exist for printing graphics screens on an Okidata printer. This interested me because I have an Okidata 92 that I plan to use on a system with a Hercules graphics card and a monochrome display.

You did not, however, identify any of these screen-dumping programs. My local dealer didn't know of any and I don't remember seeing any mentioned previously in *PC Magazine*. Can you recommend, by name, any programs that dump Hercules-generated displays to my printer?

Edmund Roberts
Delray Beach, Florida

A: *The reason I didn't recommend any such programs by name was due to a situation involving conflict of interest. I know of a program called* FRIEZE Graphics *that will do what you want, but* FRIEZE *is a product of my own software company, ZSoft Corporation. Since I write for a number of magazines in the personal computer field, you aren't likely to see published reviews of* FRIEZE *or my other ZSoft programs due to these con-*

The Most Powerful Text Editor and the Best C Compiler for your IBM-PC

EMACS™

The multi-window editing system you have all been waiting for! Now runs on MS-DOS.

EMACS: Incredibly powerful text editor with extraordinary features. (Famed Gosling version)

EMACS: Divide your screen into windows and edit several files simultaneously.

EMACS: Extensible via keyboard macros and built-in compiled MLISP programming language.

EMACS: Full freedom on keybindings; built-in documentation, abbreviations, C and Pascal programming language assist, wildcard searching.

EMACS: Many other powerful features, too!

Price: $375 (requires at least 384K)

LATTICE® C COMPILERS
NEW LOWER PRICES

Published benchmarks show Lattice C produces fastest and tighest code for the 8086 family.

Lattice C also supports the large, medium, compact and small address models.

UniPress sells native Lattice C compilers running on the PC for $500.

We also sell Unix-based cross compilers producing code for the PC:
For example, write programs on a VAX Unix for execution on the PC.

Cross compilers priced from $3000.

Call or write for more information.

UniPress Software, Inc.

2025 Lincoln Highway, Suite 312
Edison, NJ 08817
201-985-8000 Telex: 709418
Order Desk: 800-222-0550 (outside NJ)

Mastercard and Visa

Lattice is a registered trademark of Lattice, Inc.
EMACS is a trademark of UniPress Software, Inc.
Unix is a trademark of Bell Laboratories.
MS-DOS is a trademark of Microsoft.
IBM-PC is a trademark of IBM.

CIRCLE 190 ON READER SERVICE CARD

IBM PC™



64K, 1/360K Drive

$1875

IBM PC 256K

2/360K Drives

$2247

IBM PC 64K

1/360K Drive, 10 Meg Internal

$2770

Compaq 256K, 2 360K drives	$2395
Compaq 256K, 1 360K drive 10 Meg Internal	$3065
Tava PC 128K, 1 360K drive	$1495
10 Meg Internal Hard Disk	$895
64K Ram Chips for PC's	$49
Tandon TM 100-2, DS/DD	$225
Control Data 9409, DS/DD	$225
Taxan (Green or Amber) TTL Monochrome	$175
Amdek 310A Monochrome	$175
Princeton PGS HX-12(RGB)	$499
Quadram QuadColor I	$219
Quadram Quadvue	$269
Persyst Monochrome card w/Parallel port	$239
Hercules Graphics Card	$359
IBM Floppy Disk Controller	$149
AST SixPack Plus (64K)	$269
MultiMate 3.20	$339
Multiplan	$149
ProKey 3.0	$89
Flight Simulator	$37
PFS: File	$105
Wordstar Pro Pack	$415
ThinkTank	$145
Letterform 1000	$70

Prices subject to change without notice.
SHIPPING FREE WITHIN USA EXTRA FOR NEXT DAY AIR
ALL EQUIPMENT CARRIES FACTORY WARRANTY
IBM is a trademark of IBM Corp.
Credit Cards add 3% Quantity Pricing Available

PC'S LIMITED

(512) 478-5838
404 East 32nd Street, Suite 307
Austin, Texas 78705

CIRCLE 124 ON READER SERVICE CARD

flict-of-interest considerations.

FRIEZE *works with many graphics boards, including Hercules, Orchid, Tecmar, and Amdek, and with a variety of printers, including the Okidata you have. You can contact the product's primary distributor, Micro-Mart, in Norcross, Georgia, (800) 241-8149.*

Glitching Games

Q: Recently I added an expansion unit to my IBM PC, an old system with a 64K system board. After I ran all the diagnostic programs, I had no difficulty using my own library of programs.

My young daughter, however, couldn't get some of her game disks to boot. *BurgerTime*, *Apple Panic*, and *Master Type* are three that did not work.

Do you know anything about this problem? My guess is that it's due to the expansion unit's new ROM.

James H. Brown
Pleasant Valley, New York

A: *You got it! The problem must be caused by the different ROM because nothing else has changed significantly in the PC.*

Those three games probably have copy-protection schemes that are confused by the new ROM. There's a small chance that the programs are looking for a specific DIP switch setting on the system board to correspond to the information they get from the ROM, but I doubt that changing the switches alone can help. An even less likely explanation is that the presence of additional ports (used by the hard disk controller) is in conflict with the software's expectations.

You should return those programs to your dealer and ask for updated versions or a refund, because they clearly do not work on an IBM PC as advertised.

Breaking the POKE Habit

Q: I have a TRS-80 Model III with 48K RAM, two disk drives, and an Epson printer. I can POKE video addresses between 15360 and 16383 to create graphics on the screen. I also make use of other PEEKs and POKEs for keyboard input, cursor display, and other things.

For example, I can white out the screen of my TRS-80 Model III by entering this line of BASIC:

```
10 FOR X15360 TO 16383:
POKE X, 191: NEXT X
```

On an IBM PC memory map, I noticed that hex numbers, such as A4000h, are used to represent graphics and display buffers. Can you please tell me, in normal decimal numbers, the starting and ending addresses of the video memory? Is there a book that contains other PEEK and POKE addresses for the IBM PC?

Jerry Goldbaum
Flushing, New York

A: *An IBM PC, compared to the TRS-80 Model III, is a far more versatile and sophisticated machine. Thus, some things that are memory-mapped with fixed addresses on the Radio Shack machine aren't so cut and dried on the PC.*

Video memory, for example, occupies different spaces depending on whether you use IBM's monochrome or color/graphics adapter boards—and perhaps at other sets of addresses if you use a non-IBM graphics board. The IBM keyboard is not memory mapped at all, nor are the communications ports.

The customary method for communicating with the IBM PC is via BASIC commands or system calls that instruct the computer to do what you wish. By using this method, you avoid writing arbitrary PEEKs and POKEs that might work on a current PC (a.k.a. PC2), but not on a PC1 (pre-XT) or a Columbia or Compaq that might otherwise be compatible with your program.

On the IBM PC, you could white out the screen with this BASIC command:

```
10 COLOR 0,7: CLS
```

No PEEKs. No POKEs. Just straightforward code. This even gives you a simple way to set the colors used at PC-DOS

level, since the operating system will continue to display the color scheme established in BASIC until you enter the PC-DOS CLS command.

You could also white out the IBM PC's screen by writing a BASIC loop of POKEs to the video display area. To find the right memory addresses to POKE, however, your program would first have to figure out which display board was in the user's system. Once you were able to determine that the system is equipped with a monochrome display adapter, for example, you could call on this routine to set the screen to inverse video:

```
10 DEF SEG &hB000
20 REM &hB000 is mono display
   segment
30 FOR I  1 TO 4096 STEP 2
40 POKE I, 112
50 NEXT I
```

Hexadecimal (base 16) notation is used here for the segment address (&hB000) because the IBM PC's microprocessor, the 8088, insists on binary (base 2) organization, and hexadecimal numbers correspond to that structure better than decimal numbers do. I could have written a decimal number in the above program (DEF SEG 45056), but I find that a hexadecimal number like &hB000, which rounds off nicely with three zeros, is easier to remember than 45056.

In line 40 the decimal value 112 is equivalent to the hexadecimal value 70, which would be a more meaningful number to read. The first byte (7 here) indicates the background attribute and the second byte (0) identifies the foreground color.

Keep in mind that for a system with an IBM Color/Graphics Adaptor instead of a monochrome board, line 10 would need the hexadecimal value &hB800 instead of &hB000.

If you desire to interact more closely with your PC hardware than standard BASIC commands permit, you should learn the various system interrupt calls. In IBM's Technical Reference *manual you can find a fully commented source code listing of the PC's BIOS that documents all the memory addresses and interrupt calls in excruciating detail. If you plan to get that deeply into programming an IBM PC, expect to learn base 16 as you go.*

Hong Kong Currents

Q: I'd like to take my IBM PC along when I go on an assignment in Hong Kong. How can I handle the difference in electrical supplies? Where can I get any necessary equipment?

Keith K. Wann
San Diego, California

A: *Judging from the reports I've received from PC users, the computer will work just fine when it's fed foreign electricity if you connect the PC to a suitable transformer. In Hong Kong, the power is 220 volts and 50 Hz. Get a transformer to convert this. Make sure the transformer can handle all the power that the PC needs: The* Technical Reference *manual says it draws 63.5 watts, but monitors, additional disk drives, and boards will increase its power requirements.*

You may also need plug adapters because some foreign electrical outlets have different sockets. Make sure that whatever outlet you use has a properly grounded three-wire connection so you don't get shocked.

Any electrical supply house should be able to provide whatever plug adapters and step-down transformers you need. A local travel agent might also suggest some sources.

IBM's new Portable PC, by the way, has a 130-watt power supply with a switch that permits operation at either 120 or 220 volts. It also runs fine with either 50 or 60 Hz power.

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, *PC Magazine*, One Park Avenue, New York, NY 10016. ■



CIRCLE 296 ON READER SERVICE CARD

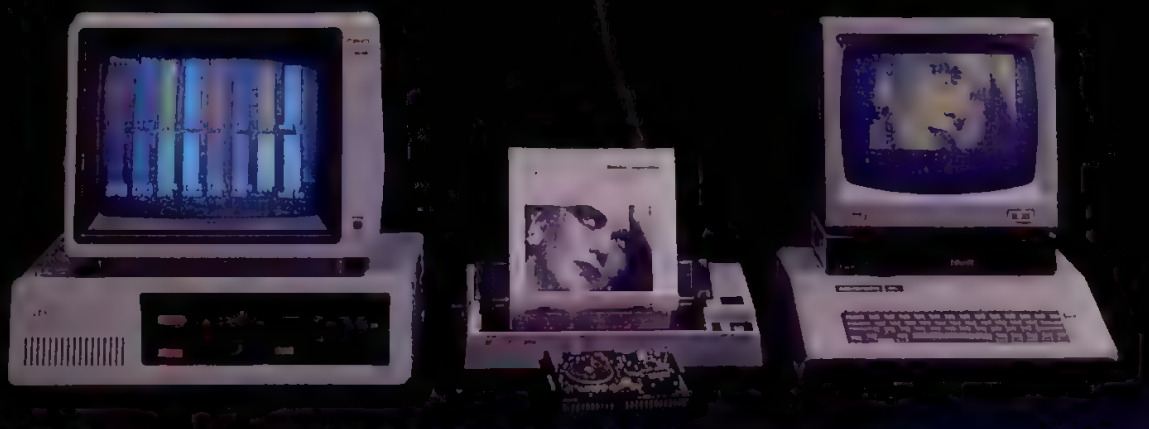
PROLOG
Language Interpreter
from LOGIC PROGRAMMING ASSOCIATES
The language chosen by Japan for their Fifth Generation of computers.
*** Expert Systems**
*** Intelligent Data Bases**
*** Artificial Intelligence Programming**
*** Software Prototyping**
Single Computer License Fee including full Documentation $295
Documentation only $ 45
- CP/M 80 systems need at least 48K RAM
- MS DOS or PC DOS systems need 128K

Ask about **APES** Augmented **Prolog Expert System** and our New York Seminar, August 28-29, 1984 given by the team from Imperial College, Logic Programming Dept., London.
Programming Logic Systems, Inc.
31 Crescent Drive
Milford, Conn. 06460
(203) 877-7988
CP/M is a registered trademark of Digital Research Inc.
MS DOS is a registered trademark of Microsoft Corp.
PC DOS is a registered trademark of IBM

CIRCLE 126 ON READER SERVICE CARD

IN THE BEGINNING, THERE WAS IBM & APPLE®. NOW THERE'S Super 5™

THE FINEST QUALITY PERIPHERALS FOR IBM/APPLE® AND THEIR COMPATABLES.



SLIM LINE DRIVE
- T-40 TEAC Direct Shaft Drive for Apple® with 5 write-protected options.
- C-40 Chinon Direct Shaft Drive for Apple®
- Double-Sided Direct Shaft Drive for IBM
- 32 mm Height, 3.5 inch Direct Shaft Drive for O.E.M.

10M BYTE HARD DISK SYSTEM
- Low Power Slim Line Hard Disk with Intelligent Controller & Cables. Internally Installed in IBM PC.

BLOCK MATRIX PRINTER
- CP-80 Block Dot Head with Friction Feed
- P109/120 cps with Letter-Quality & Draft Hard Print

HIGH QUALITY MONITORS
- 100A Amber with 20 MHZ Video Response for Apple®
- 500 A.G. Amber, Green with Rotary Stand for IBM.
- 55C 14 inch RGB Color with Rotary Stand for IBM.

Mitsuba Corporation
667 Brea Canyon Road, #25
Walnut, California 91789
Tel: (714) 594-6959
Outside Calif. 1-800-MITSUBA
Japan TLX: 23325 EI-EN ENT

IBM is a registered trademark of IBM Corp.
Apple is a registered trademark of Apple Computer Inc.

CIRCLE 342 ON READER SERVICE CARD

HOW TO USE COMPUTERS TO TEACH MATH!

COMPUTERS IN MATHEMATICS:

A SOURCEBOOK OF IDEAS—EDITED BY DAVID H. AHL

Here's a goldmine of learning ideas, problem-solving strategies, programming hints, puzzles, brain teasers and more for the math teacher or student with access to a computer!

This book of reprints from *Creative Computing* magazine covers nine important subject areas:
- Computer literacy.
- Thinking strategies and problem solving techniques.
- Computer simulations.
- Probability.
- Mathematical miscellany, from circular functions to differential equations.



- Art and graphics in math.
- Computer Assisted Instruction.
- Programming style.
- Puzzles and problems.

In all, COMPUTERS IN MATHEMATICS contains 77 fascinating articles, over 200 problems and nearly 100 programs. This practical volume is an invaluable classroom tool for math teachers and students in Grades 6-12. 8¼" x 11", softcover, hundreds of illustrations and diagrams.

USE COUPON TO ORDER YOUR COPY TODAY

CREATIVE COMPUTING PRESS Dept.NV7C
39 East Hanover Ave., Morris Plains, NJ 07950

Please send me _____ copies of COMPUTERS IN MATHEMATICS, at $15.95, plus $2 postage and handling,* each. #12D

CHECK ONE:

☐ **PAYMENT ENCLOSED** $ _____. (CA, NJ and NY STATE residents add applicable sales tax.)

☐ **CHARGE MY:** ☐ American Express ☐ MasterCard ☐ Visa

*Outside USA add $3.00 per order.

Card No._____Exp. Date_____

Signature_____

Print Name_____

Address_____Apt.____

City_____

State_____Zip_____

For faster service,
CALL TOLL FREE: 800-631-8112.
(In NJ call 201-540-0445)

Looking It Up on Knowledge Index

Tired of thumbing through old magazines to find a desperately needed article? The Knowledge Index gives easy access to hundreds of computer publications at a bargain price.



Illustration: Michael Ng

I don't know about you, but I've got more computer magazines on file than the Library of Congress. My attic groans under their accumulated weight, but no more than I groan at the thought of having to rummage through them to find a particular article, hardware or software review, or other piece of desperately needed information.

If you're in a similar situation, you'll be happy to know that there is a better way. A *much* better way. It's called The Knowledge Index (KI), and it's brought to you by Dialog, the General Motors of the information age.

The Knowledge Index is the off-hours equivalent of Dialog and can be reached via Telenet, Tymnet, or Uninet. It operates (according to your local time) Monday through Thursday from 6 p.m. to 5 a.m., Friday from 6 p.m. to midnight, Saturday from 8 a.m. to midnight, and from 3 p.m. Sunday to 9 a.m. Monday. The $35 sign-up fee includes 2 free hours on the system. After that, connect time is billed to your credit card at $24 per hour, complete. Unlike Dialog, The Knowledge Index does not levy a separate fee for each citation you elect to read, and it does not charge a monthly minimum.

The Knowledge Index
3460 Hillview Ave.
Palo Alto, CA 94304
(800) 528-6050 x415
List Price: Initial fee, $35; connect time, $24/hour.
Requires: RS-232 serial interface, modem.

CIRCLE 681 ON READER SERVICE CARD

What's Available?

At this writing, The Knowledge Index offers nearly 25 files, each of which contains a certain category of information. The Books-in-Print file, for example, will give you a list of all books on a particular topic or by a particular author. And Newsearch lets you locate stories in over 370 popular American magazines, plus the *Wall Street Journal*, the *New York Times*, and the *Christian Science Monitor*. These newspapers are indexed daily and ready for searching 24 hours after publication.

Of special interest to anyone with an attic full of computer magazines are the four files that focus on computers and computing. INSPEC handles the heavy stuff—physics, electronics, circuit and chip design, and the like. The International Software Database profiles over 52,000 mini and micro programs. The Microcomputer Index focuses on over 40 English-language computer magazines. And The Computer Database, offered by Management Contents, Inc., includes citations from more than 500 journals, proceedings, transactions, books, newsletters, and

MICRO MART™ STRICTLY BUSINESS AT A DISCOUNT

floppy disk drives

TANDON TM 100-2 FULLY IBM PC COMPATIBLE **$209**
CALL FOR QUANTITY PRICING . . . . . .

½ HT. DISK DRIVES TOP NAMES **$179**
SOUTH'S LARGEST SUPPLY•DEALER INQUIRIES INVITED . . .

networking/protocol conversion

PC Turbo by ORCHID
80186 Co-processor Board • Speeds Up PC 5 Times

IRMA "STILL A BEAUTY" REPLACES 3278's WITH PC's **/IRMALINE**

PC Blossom 64 386K Multifunction Board W/Opt. PCnet Interface

BLUE LYNX 5251/3276 EMULATOR

SNA & BISYNC • 3780, 5251, 3274

FORTE DATA 3278/3279 Emulator w/SIIG. Plus Graphics Capability

printers

AMDEK AMPLOT II Supports LOTUS 1-2-3 Graphics **$799**
Houst. Inst. Plotters & Digitizer . . CALL!

DOT MATRIX

EPSON FX80 & 100 (160 cps) . . . . Best Price!
EPSON RX80T or F/T . . . . . Best Price!
EPSON RX80 & 100 . . . . . Best Price!
EPSON LQ 1500 NEW! Letter Quality in a Dot Matrix . . . . . Best Price!
Mannesman Tally Spirit 80 . . . . . **$289**
RAYDEX Series New Low Cost High Quality Dot Matrix by StarMicronics . . . . . CALL!
Prism Color IBM's Choice for LESS, 132 Col (200 cps) Color Graphics **$1495**
OKIDATA 92&93 Opt IBM Proms 160 cps . . . . . Best Price!
OKIDATA ML84 200 cps . . . . . Best Price!
OKIDATA 2410 Pacemark (350 cps) . . . . Best Price!
TOSHIBA P-1351 & 1340 . . . Best Price!
GEMINI 10X & 15X . . . . . **$279/$399**
T.I. 855 24 WIRE PIN HEAD, NOW IN STOCK! . . . . Best Price!
NEC P2 & P3 180 cps . . . . . Best Price!
DIABLO P38 (400 CPS) **$1695**

LETTER QUALITY

NEC SPINWRITERS 2050, 3550 & 7730 Best Price!
DIABLO 630 ECS for PC **$1845**
DIABLO 620, 630 API . . . . . New Low Prices!
C-ITOH Starwriter (40 cps) Printmaster (55 cps) . . . . . **$1055/$1455**
QUME SPRINT 11/40 PLUS SPRINT 11/55 PLUS . . . . . Best Price!
LQ Feeders Great Cut Sheet Feeders for NEC 3550 & C ITOH Starwriter Diablo NOW AVAILABLE . . . . SAVE!

chips

CALL FOR QUOTE ON QUANTITY CHIP PURCHASES

INTEL 8087 High Speed Math Coprocessor **$175**
64K RAMCHIPS . . . . . **$55/$159**
(64K-9 Chip/Upgrade Kit) (192K-27 Chip/Upgrade Kit)

Advertised cash prices subject to change without notice.

hard disks

Peachtree Peripherals P-10 Industry's Best Buy•10 Meg/F. Auto Boot•Runs W/Out Ext. Power Internal or External Installation

SYSGEN 10 & 20 MEG/F W/Streamer Tape *Faster Streaming & Formatting* . . . . . CALL!
IOMEGA Bernoulli Box • 10 MEG Removable Cartridges • Single or Double Drive **$2795**
DAVONG 10 MEG/F 15, 21, 35 Available External **$1575**
SYSGEN IMAGE Streamer Tape Back Up For Your IBM XT . . . . . CALL!

ALL NAME BRANDS AVAILABLE NOW! BEST PRICES!!
IF YOU DON'T SEE IT— . . . . . CALL!

multifunction boards

#1-384K 64-384K•Clock Ser & Par Pts Ram Disk•Spooler•Opt Game Pt . . . . . Best Price!
#1 MultiCard Max: 8 Func (64-512K) W/Opt. Game Pt. . . . . Best Price!
#1 I/O Card Ser. Clk. Spooler Ram Disk (Opt 2nd Ser, Par & Game) . . . . . Best Price!
QUADBOARD New Version 64-384K . . . . . **$279/$549**
CAPTAIN 64-384K **$269**
SEATTLE RAM + 3 0-256K•Ser•Par Flash Disk•Clk•Spooler **$179**
J-RAM II 512K Multifunction . . . . . CALL!
PROFIT Systems 64-512K RAM Plus & Elite . . . . **$299/$680**
BABY BLUE II 64-256K•Z80B•Par•2 Ser•Clk RAMdisk•Spooler•Extra Software . Best Price!
PC Blossom ORCHID's 6-Pak Clone with Optional PCnet Piggy Back . . . . . starting at **$275**
MAYNARD SANDSTAR Floppy & Hard Disk Controller Cards . . . Best Price!

monitors

PGS-MAX 12 Amber • Runs off IBM Mono Card • 720h x 350v . . . . Best Price!
PGS SR-12 690x480 • Non-Interlaced Mode RGB W/HiRes Text, W/Color Card . . . Best Price!
PGS-HX 12 HiRes 690 Dot RGB . . . . . Best Price!
QUADCHROME HiRes RGB . . . . . Best Price!
AMDEK COLOR IV 720 Dot **$549**
AMDEK 300 A/300G 12" . . . . . **$149/$139**
AMDEK 310A Amber 12" Improved Alternate to IBM Green Screen **$185**

IBM is a registered trademark of International Business Machines
Micro Mart is a registered trademark of Micro Mart Inc

CIRCLE 503 ON READER SERVICE CARD

THE SERVICE LEADER ★ CORPORATE BUYERS WELCOME

software

Open Access Spreadsheet, 3D Graphics Word Processor Time Manager & Communications in One Pkg **$299!**

JACK 2 Integrated Word Processing, Spread Sheet Data Base Management Chart on One Screen $299
Decision Manager All New Integrated Software by Peachtree . . . . . CALL!
VisiOn Applications Manager Calc • Word • Graph • Query . . . . . CALL!
KEY II 1-2-3 Outstanding Utility for LOTUS Unlocks Information Management $159
SuperCalc3 World's Most Usable Spreadsheet Superior Graphics to LOTUS $225
Lattice C-Compiler Version 2.0 Supports One Meg RAM on PC $299
MICROSOFT COMPILERS . . . . . CALL!
DIGITAL RESEARCH COMPILERS . . CALL!
Norton Utilities A Must for Every IBM PC $59
ProKey 3.0 RoseSoft $95
CROSSTALK XVI MICROSTUF . . . . . CALL!
SMARTCOM II Hayes $89
Dow Jones Full Line, Now W/Full Acct'ing, Comm. & Sales Planning Joining Fine Stock Mkt. Pkg's. . . . . CALL!
IUS A.R., A.P., G.L., Inventory, Order Entry, Payroll . . . . . Starting at $299
Peachtree Accounting . . . . . CALL!
Open Systems A.R., A.P., G.L., Payroll, Job Cost, Inventory, Order Processing . . . . . CALL!
Multilink Multi User, Multi Tasking Package Supports Up to 8 Dumb Terminals off IBM PC . . . . . CALL!
Set-FX PLUS NEW! Epson FX Series Control Pkg. $45
Sideways Inverts Printout $49
ATI Training Critics Choice Software Tutorials $49

modems

HAYES SMARTMODEM 300, 1200 & 1200B . . . . . CALL!
NOVATION Entire Line of Value-Packed MICRO MODEMS Inc. Access 1-2-3, the Internal w/Crosstalk XVI . . starting at $99
RIXON 1200-4800 BAUD • IBM PC Compatible . . . . . CALL!
Signalman Mark XII 300-1200 Direct Connect Quality at a Low, Low Price $259

graphic cards

HERCULES Monochrome Graphics Supports LOTUS 1-2-3 . . . . . CALL!
PLANTRONICS Color+ Biplaner, Super Hi/Res With Color Magic . . . CALL!
Graphics Master Tecmar-Color & Mono Graphics Supporting Lotus . Low Price!
QUADCOLOR I & II . . . . . CALL!
Paradise Sys. Color Graphics/Monochrome Parallel Printer Port $379
STB Graphix Plus Color & Mono Graphic • Par. Port RAM Disk • Spooler • Lite Pen Port • Opt. Clk Cal . . . . . CALL!
Multigraph 132 Col in Mono W Graphics 720h x 350v Color Graphics to 640h x 400v • Opt Par. Port . . . $375
Amdek MAI Color Graphics Monochrome Par. Prt. Port 8 Pages Storage HALO Light Pen Port Super W Color IV . . $345

Atlanta, Charlotte, Washington D.C., Tampa, Ft. Lauderdale, Orlando, Louisville

HARVARD PROJECT MANAGER NEW CALL!
Infoscope New Data Base from Microstuf. Critically Acclaimed!! . . . . . CALL!
R:base 4000 or 6000 Report Writer & Clout Microrim . Starts at $329
Power-base GMS Systems•Combination of Relational & Hierarchical Data Base . . . . . CALL!
Knowledge Man Ver 1.06 Now Available for this Highly Acclaimed Data Base $295
dBaseIII NEW! "C" Language Easy to Use and Ultra Fast . . . . . CALL!
dBaseII Ashton Tate $389
MultiMate 3.22 "WANG" Style Word Processor With Spelling Checker $279
PFS Write, File, Report, Graph, Solutions, Access . . . . . Ea. At. $99
Microsoft Word W/Mouse•Fourth Generation Word Processor•Use Up to 8 Windows . . . . CALL!
VOLKSWRITER DELUXE $189
WordStar ProPak Now W/Free Tutor! CorrectStar, MailMerge . . . . . CALL!
WordPerfect SSI Available Now by Popular Demand . . . $299
Easy Writer II System Includes Speller & Mailer $219
Peach Text 5000 . . . . . $179
FRIDAY! Ashton Tate $195
QUICKCODE/dGraph/dUtil 50% OFF . . . . . CALL!
PC Paint Brush Amazing Mouse Drive Graphics W/Screen Dump Utility $99
Chart-Master/Sign-Master . . . . . CALL!
"CAD Systems" Best Selection Available of Computer Aided Design Graphics . . . . CALL!
ENERGRAPHICS Hot New Graphics Package $269
CopyII PC $35

miscellaneous

Keytronics 5151 New Improved . . . . . CALL!
MOUSE Optical Type LOTUS & VisiOn Compatible By Mouse Systems $209
CURTIS Monitor Pedestal Keyboard Extension Cable, Monitor Extension Cable . . . CALL!
MICROFAZER (8K-128K) Stack Spooler . . . . . Starting At $139
BACK UP Power Supply 200/425/625 Watts . CALL!
ISOBAR Surge Protectors • With Great Filtering Via Isolated Outlet Pairing • 4 & 8 Plug . . . . . Starting at $55

ORDERS ONLY
1-800-241-8149
Monday-Friday 9:00 AM-10:00 PM; Saturday 9:00 AM-5:00 PM

MICRO MART™

TECHNOLOGY CORPORATE CAMPUS
3159 Campus Drive • Norcross, GA 30071

For Information	1-404-449-8089
Technical Support	1-404-446-3836
Telex	880497

assorted product announcements.

Like most online information services, The Knowledge Index contains citations or abstracts rather than the full text of an article. These abstracts, prepared by professional indexers, are designed to give you enough information to decide whether you want to obtain a copy of the entire article, but the abstracts themselves may contain the facts you are looking for.

You can obtain photocopies of any article referenced by any KI database. The cost is $6.25 per order ($8.25 outside of North America), plus 20 cents a page. Orders can be placed on-line and normally require from 1 to 2 weeks to fill, but "rush" service is available for an additional fee of $6.00 per item.

The best way to get a handle on the kind of information a KI file provides is to look at Figure 1. I needed a graphics package capable of producing a slide show for a presentation I had to do, so I signed on and entered The Computer Database. By design, KI offers a much simpler search language than Dialog, and the manual does an excellent job of showing you how to use it. At the system's question mark prompt I simply entered: Find IBM And Graphics And Slide? to start the search.

This told the system to retrieve only abstracts containing all three of these terms. I used the question mark "wildcard" character after Slide to be sure of finding "slides," "slideshow," and any other permutation. The response was quite fast. The system listed the number of articles containing each term and the number containing *all* of the terms I had specified. I began the second phase of information retrieval: taking a look at what the system has found for you. On KI, if you merely enter the word "Display," the system will present the most recent citation in the file. I asked to have the fifth citation in Set 1 listed in the Long mode. This produces the complete citation, part of which is shown in Figure 1.

```
?BEGIN COMP4 <--------------Go

MM/DD/YY HH:MM:Now in Computers & Electronics (COMP)
            Section
  The Computer Database (COMP4)
  Corp. Managems 1984

?FIND IBM and GRAPHICS and SLIDE? <----Tell system what to look
                                       for.  Note a question mark is
                                       used as a "wildcard."

              4985 IBM
              3698 GRAPHICS
               111 SLIDE?
        S1     11  IBM AND GRAPHICS AND SLIDE?<---11 references
                                       or "hits," labelled S1 ("set
                                       1") for convenience

?display S1/LONG/5 <----Display citation 5 in Set 1 using the
                        LONG form.
          Display 13/L/5 <---System tells you what it's doing.
                          The target citation follows.


111376   PCI83F0215
   Software: The PC Draws with Templates and Palettes.
   Derfler, F.J.
   PC  (Independent Guide to IBM Personal Computers) No. 1, June
   1983, P. 215,217,218+. 7 Pages.
   Country of Publication: U.S.A.   Language: English
   CODEN: PIGCDO   ISBN: 0745-2500
   Availability:  Available from Management Contents through
   on-line ordering or toll-free at our 800 number.
   Document Type: Journal   Article Type: Software Review
   Special Features: Includes Drawings; Diagrams
   Four programs available for the IBM Personal Computer that
aid in drawing and saving various types of diagrams and shapes
are Glphix and Frieze by Starside Engineering, PC Crayon, and
PC-Draw by Micrografx. Glphix is a package that will allow
shapes to be drawn free form or by entering parameters into
functions to build specific shapes such as a circle. Frieze is a
program that stores the shape. They list for $24.95 and $55.00
respectively and require 64K, BASICA, and a color/graphics
adapter and color or non-IBM monitor. PC-Crayon has the same
capabilities as Glphix and Frieze, with the added feature of
                                                  For more, enter PAGE
```

Figure 1: *Searching The Computer Database for articles on IBM PC graphics and slides.*

Conclusion

I found the response time on The Knowledge Index to be excellent, and the commands are easy to understand and use. And $24 an hour is not an unreasonable price to pay for this service. In fact, it's a bargain. The search shown in Figure 1 cost less than $1, whereas searching The Computer Database on Dialog during the regular business day would cost $85 an hour, and you would be charged for each citation "displayed."

Two caveats apply, however. The first is the currency of the information in the various files. Supplying updates is the responsibility of each database vendor, and their policies vary. The Computer Database is updated every 2 weeks.

The second caution is to make sure that you read the manual. Lots of examples and sample searches are provided, and you might want to use some of your initial two hours to work through some of these. Once you take the time to get into the swing of online searching, you'll discover that The Knowledge Index can be an incredibly powerful resource, and you'll never have to go rummaging through your prized magazine collections again. ■

Alfred Glossbrenner is the author of The Complete Handbook of Personal Computer Communications *and* How to Buy Software, *both from St. Martin's Press. He can be reached at TCS772 on The Source and at 70065,745 on CompuServe.*

COMING UP

PCjr.

A Member of the Ziff-Davis Family of IBM PC Magazines

Flight Simulator
America's number one game now comes in a Junior version. We'll let it fly and take a look at two more simulation games along the way.

Junior at Work
IBM's Cluster Program allows interconnection of up to 64 computers for business use. Learn how Junior fits in.

New Disk Drives
The latest on second disk drives for your PC*jr*, proving that two heads are better than one.

Word Play
We'll try our hand at the text according to *NewWord*. It'll shake your faith in other word processing programs.

Sound Advice
An excerpt from Peter Norton's new book explores the magical mystery of Junior's three-tone sound capabilities.

Comp-U-Store.
An on-line shopping mall for those who'd rather let their fingers do the walking. Plus a visit to the comp-u-storeroom.

Columns
Editor's Wire by Corey Sandler; Junior Explorer by Peter Norton; Screen Play by Don Kennedy; Opinion by Lindsy Van Gelder and Stephen Manes; Education by Martin Porter; Logo by Winn Rosch; BASIC by John Woram; Communications Networks by Eric Freedman; Reader to Reader by Paul Somerson. Q & A by Steve Rosenthal.

Save space, improve ergonomics and system life.

reduce footprint!



The SS-I System Stand by Curtis offers you more freedom of arrangement. Reduces the systems unit footprint by 54%. Use less desktop space, or no desktop space at all – put it on the floor! It feels great. Also, with less disk drive wear in the vertical position, systems unit can be expected to have a longer life and less down time with the SS-I.

Get the sturdy SS-I and stand your systems unit on its ear – it feels great and lasts longer.

Re-arrange your IBM PC ... comfortably

Developed exclusively for the IBM PC, all Curtis products have a lifetime warranty and are a perfect PC match in color, style and finish.

PC Pedestal™ II, Tilt and Swivel Base . 79.95 (for IBM PC Monochrome and Color Displays)

AD-I Adapter for PC Pedestal™ ..... 9.95 (for Princeton Graphics Systems and Quadchrome Displays)

SS-I System Stand ..... 24.95 (for IBM PC System Unit)

EC-I 3′ Extension Cable Set ..... 49.95 (for IBM PC Monochrome Display)

EC-II 3′ to 9′ Extension Cable ..... 39.95 (for IBM PC Keyboard)

Manufacturing Company, Inc.

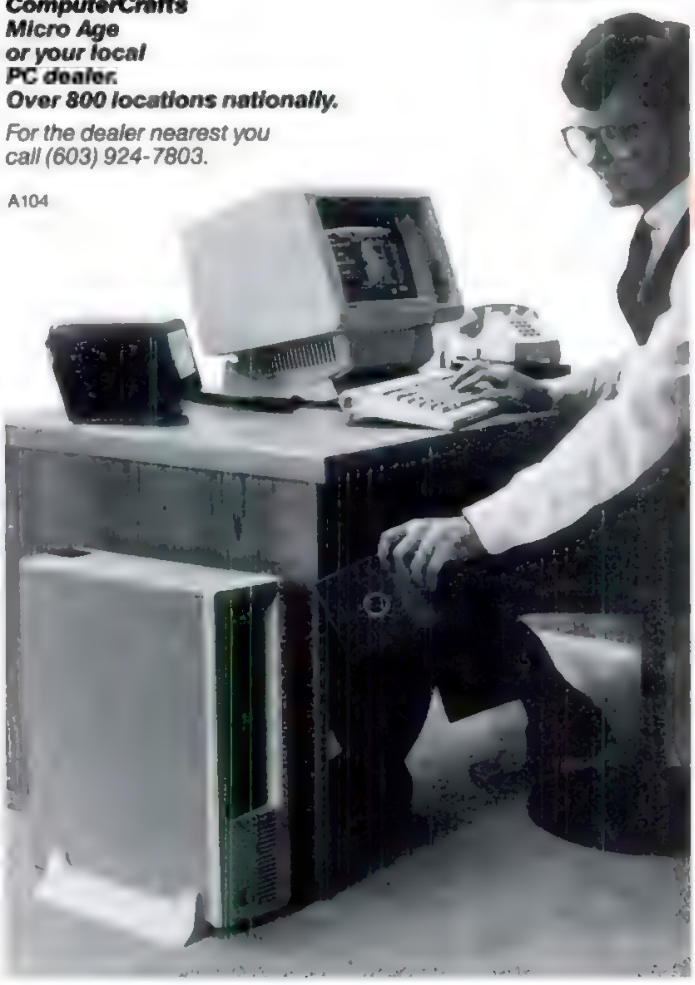
CURTIS

Curtis Manufacturing Company, Inc.
Peterborough, NH 03458

Available at all ComputerLand Stores Entre Computer Centers ComputerMarts ComputerCrafts Micro Age or your local PC dealer. Over 800 locations nationally.

For the dealer nearest you call (603) 924-7803.

A104



Computer Woodenware by New England Wood Designs, Dublin, New Hampshire 03444

Copyright © Curtis Manufacturing Co., Inc.

IF POWER FAILS, DATASAVER TAKES OVER!

PROTECTION – saves data during power failures.
– saves hardware from overvoltage transients.
PORTABILITY – allows mobile or extended holdup time using auxiliary 12 volt battery.
FEATURES – internal battery provides 5 min. + operating time – AC line conditioning
– audible and visual alarms, interrupt signal – compact, desktop styling
– no installation required.

200 WATT — $495
IBM PC/XT

90 WATT — $350
IBM PCjr

Instant power order line
805-541-4161

CUESTA SYSTEMS, INC.
3440 Roberto Court, San Luis Obispo, California 93401

INSTANT AC POWER



CIRCLE 141 ON READER SERVICE CARD

Say goodbye to the Tower of Babel with...

XENO-DISK™

The disk production system for your PC!



Read, write, format and duplicate 70 disk formats on your IBM-PC or compatible under MS-DOS. Developed from our popular Xeno-Copy™ utilities. Now supports popular 8" and 96 TPI formats.

XENO-DISK..... $379.50

Also available:

- XENO COPY™ $99.50
  Read and transfer 70 formats to PC/MS-DOS (one way transfer)
- XENO-COPY PLUS™ $149.50
  Read and write 70 formats (bi-directional file transfer)
- ADVANCED™ Option ..... add $50.00
  Supports 8", 96 TPI, parameter input for other formats. Included in XENO-DISK.

RUN CP/M-80 PROGRAMS ON YOUR PC.... $99.50!

80MATE™, our CP/M emulator, will run almost any CP/M-80 program under MS-DOS. No need for expensive co-processor boards!

See your dealer or call for information.

Vertex systems inc.

Dept. M, 7950 W. Fourth Street
Los Angeles, CA 90048
(213) 938-0857

CIRCLE 131 ON READER SERVICE CARD

COMING UP

FOR IBM PERSONAL COMPUTERS

TECH JOURNAL

A Member of the Ziff-Davis Family of IBM PC Magazines

Pascal Times Four

A comparative review of four major Pascal compilers: IBM/Microsoft Pascal, Digital Research's Pascal/MT+86, Software Building Blocks' SBB Pascal, and Borland International's Turbo Pascal. *Tech Journal* reviewers judge each compiler by ten criteria: documentation, ease of use, compilation speed, output code speed, output code efficiency, extensions to the ISO Standard, program fragmentation, file I/O, real number handling, and low-level machine hooks.

Modems Demystified

An excerpt on how modems work from the book *Digital Communications Programming on the IBM PC* by David Schwaderer detailing the technical process by which modems translate, send, and receive information.

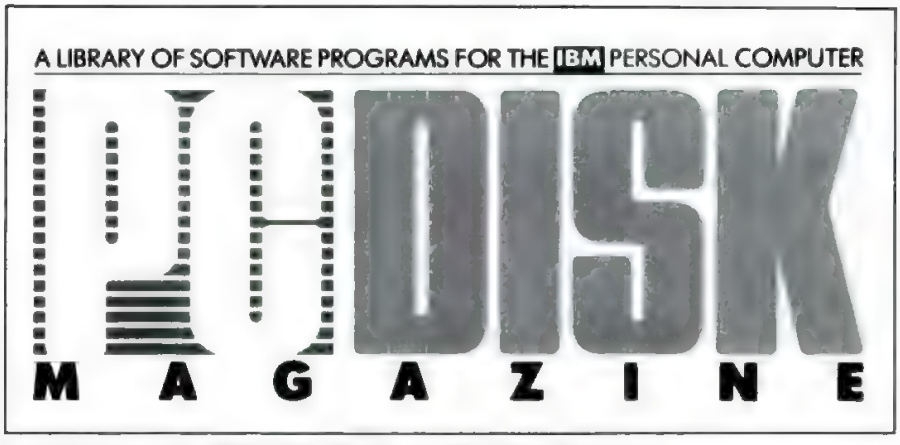
Product Review

The word *crosstalk* has bad connotations for people in the communications industry, but our reviewer found that *Crosstalk XVI*, a full-featured communications program for the IBM PC, changes the meaning of the word.

Mathematical Modeling With TUTSIM

This simulation tool for creating mathematical models of circuits, machinery, and systems was originally designed to run on the PDP 11, but it has been redesigned to run on the IBM PC. A complete technical review.

COMING UP



A Member of the Ziff-Davis Family of IBM PC Magazines

Wine Data 3

Oenophilists rejoice! Now you can refer to a convenient data file to learn about various quality wines. Our previous two issues detailed the wines of France and Italy, and we now offer our final installment that covers the wines of our own sunny California. From Chardonnay to Zinfandel, the United States' most popular wines are evaluated according to grape variety. Find out about the origins and distinctive characteristics of these grapes, the wineries that produce them, and the vintages that are worthy of notice. Gather enough information to stock your cellar and intimidate wine stewards.

CURVE FITTER

For those of us who must work with mountains of data yet are not mathematically inclined, this program is a lifesaver. *CURVE FITTER* helps you assemble and plot a set of data and then determines the relationship among these points. Using the least-squares fit regression method, the program chooses the type of curve that best fits your data, then plots it against the data points. The resulting curve—linear, exponential, second order, logarithmic, or power—helps you make projections. You'll never need to plot with paper, pencil, and eraser again!

PRINT FORMATTER

Everyone knows that graphics and varied typefaces make printed matter more attractive and readable. No doubt your own printer can produce a modest number of character variations, but the available choices, and the time required to implement them, are often discouraging. *PRINT FORMATTER* simplifies the process by letting you insert single-letter control codes directly into the text that you send to the printer. When used with the IBM/Epson or Okidata printers, these codes in turn activate the various printer features. But you do not have to use *PRINT FORMATTER*'s simplified codes; if you wish to use another kind of printer, or print features not included in the program, you can use the actual control codes, input either in ASCII form or as the characters themselves. The choice is yours, but the impressive results are the same.

FAST SIDEWAYS PRINTING FOR YOUR EPSON

Now you can print multi-page **spreadsheets** or reports as wide as you like on your FX printer, **sideways** on your paper, in a choice of five different type sizes, at **full text-mode speed.** And you can print in super-fast two-pass dot-matrix **letter quality**. Or create a printer buffer of up to 32K.

Printer Boss™ software also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC, eliminating character printout incompatibilities between IBM-PC software and Epson FX printers while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. **Ideal** for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 318 ON READER SERVICE CARD

How to make your IBM run 2½ to 4 times faster.



Just plug in the Accelerator PC™ and watch your IBM* PC or XT take off.

Yes, Titan's done it again. The innovators who speeded up the Apple® now bring similar performance advantages to IBM users. Imagine running Lotus® 1-2-3™, VisiCalc®, or Multiplan™ without long delays. With the Titan Accelerator PC, your IBM PC or XT can run all your software faster. Data bases, word processors, spreadsheets, graphics, and much more will speed up by a factor of 2½ to 4 (average around 3).

The Accelerator PC has a 10 MHz 8086 processor and 128K of high-speed RAM, expandable to 640K with the memory upgrade piggyback option. It's compatible with your present hardware and software, and designed to be ready for future enhancements.

Get your work done in a third of the usual time.
See your computer dealer today or contact: Titan Technologies, Inc., P.O. Box 8050, Ann Arbor, MI 48107; Telephone (313) 662-8542.

Titan
TECHNOLOGIES, INC.
FORMERLY SATURN SYSTEMS OF MICHIGAN

Sales and Marketing by The MARKETING RESOURCE GROUP, Fountain Valley, CA.

IBM is a registered trademark of International Business Machines Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. Multiplan is a trademark of Microsoft Corporation. Apple is a registered trademark of Apple Computer Inc. VisiCalc is a registered trademark of VisiCorp, Inc. Accelerator PC is a trademark of Titan Technologies, Inc.

CIRCLE 802 ON READER SERVICE CARD

Index To Advertisers

RS #	Advertisers	Page
114	Advanced Computer Products	280
113	Advanced Computer Products	286
117	Ann Arbor Software	32
*	Apparat	248
102	Apparat	249
121	Applied Computer Products Corp.	46-47
157	Ashton-Tate	215
184	Ashton Tate	106
209	Ashton Tate	224-225
103	AST Research	274
104	AST Research	275
101	AST Research	82-83
139	BASF	42
150	Blaise Computing Inc.	262
*	Borland Int'l	43
*	Borland Int'l	18-19
213	Bottom Line	77
106	CDI 100	362-363
238	Chang Laboratories	308-309
170	Chelsea Skye	380
228	Compu Add Corp.	292
172	Compucable	356
205	Compuclassics	346
234	CompuMail	282
229	Compusa	331
226	Compuserve	101
192	Computer Control	380
230	Computer Discount Products	87
115	Computer Hut of New England	283
183	Computer Mail Order	72-73
135	Computer Warehouse	290
300	Condor	C-2
317	Connecticut Software	358
316	Connecticut Software	293
318	Connecticut Software	375
196	Contemporary Computerware	338
152	Cosmos	70
125	C Source	359
141	Cuesta Systems	374
*	Curtis Manufacturing	373
108	Data Access Corporation	74
176	Data Sources	255
118	Data South	97
219	Davong Systems	14
189	Diamond Software	75
444	Digital Communications	30-31
*	Diskette Connection	331
166	Diversified Computer Systems	338
208	Dynax	20
235	Eastern Enterprises	167
236	800 Software	88
134	Enertronics Research	85
133	Flagstaff Engineering	94
112	47th St. Photo	344-345
306	Funk Software	76
319	Garden of Eden	266
260	H&E Computronics	382
303	Hayes Microcomputer Products	158-159
*	Hercules Computer	5
*	Hercules Computer	59
222	Human Systems	357
136	IBM	24-25
171	Imaging Technology	276
109	Individual Software	63
110	Innovative Data Technology	166
	Innovative Software	48A-F
186	Interface	16
187	Interface	16
167	Intra Computer	343
168	Jameco Electronics	359
111	Jaspir Int'l.	359
271	Knowledge Systems	90
276	Laboratory Microsystems	250
116	Lifeboat Associates	95
295	Logicsoft	262
282	Logicsoft	294-296
296	Logicsoft	367
130	Logic Unlimited	50
202	Logitech	290
263	Macola Inc.	338
386	Magnum PC	137
437	Maynard Electronics	138
290	MCP Applications	284
525	MDBS	164-165
148	MicroDesign	127
315	MicroFlash	157
181	Micrografx	80

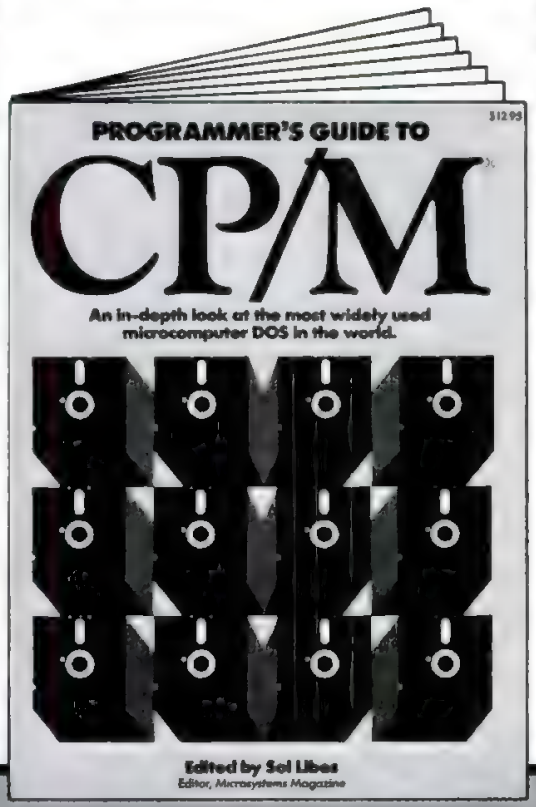
INDEX TO ADVERTISERS

RS #	Advertisers	Page
516	Microlog	273
201	Micromail	312
159	Micromart	4
478	Micromart	40
503	Micromart	370-371
231	Micropro Int'l	199, 201, 203
*	Microsoft	44-45
422	Micro Storehouse	51
326	Microstuf Inc.	265
331	Micro Ware	92
341	Micro Xpress	263
342	Mitsuba	368
340	MLI Microsystems	338
127	Morningstar Microcomputer	260
*	Multimate	304-305
120	Northeastern Software	297
346	Norton Utilities	337
357	Office Solutions	26
467	O'Hanlon Computer Systems	254
285	Okidata	168
123	Orchid Technologies	205
122	Orchid Technologies	207
484	Paradise Systems	71
288	PC Brand	36-37
339	PC Connection	132-135
124	PC Limited	366
360	PC Link	341
535	PC Network	270-271
499	PC Warehouse	272
523	Personal Cad Systems	220
512	Persyst	152-153
143	Pipeline Computers	332-333
160	PowerBase	288-289
154	Precision Data Products	331
309	Prentice-Hall	8-9
	Preview Publishing	104-105
299	Princeton Graphic Systems	268
374	Professional Software Inc.	23
372	Professional Software	21
126	Programming Logic Systems	367
327	Quadram Corp.	12-13
250	Quadram Corp.	22
251	Quadram Corp.	38
158	Quaid Software Ltd.	250
412	Quant Systems	331
334	Qubie Distributing, Inc.	110
383	Qubie Distributing, Inc.	256
384	Qubie Distributing Inc.	54
497	Quentin Research	328
493	Quest Research, Inc.	29
182	Rogue River Software	328
396	R.P. Marketing	84
*	Safeware	127
149	Satellite Software International	10
370	Seequa	53
823	Sensible Designs	86
451	Softcorp	98
452	Softcraft	245
*	Softline	79
454	Softech Microsystems	1
253	Softstyle	298
453	Softman	285
534	Softrend	2-3
425	Software Banc	147
252	Software Research Technologies	17
458	Software Strategies	47
119	Spies Labs	146
430	STB Systems Inc.	C-3
445	Tallgrass Technologies	27
487	Tall Tree Systems	360
188	Taxan	102
375	TAVA PC	237
382	TDI	78
501	Tecmar Inc.	142-143
502	Tecmar Inc.	C-4
128	Telesoft	269
347	Televideo Systems	108-109
802	Titan Technologies	376
207	Tseng Labs	56
448	U.S. Robotics Inc.	253
190	Unipress	365
464	Vental	28
131	Vertex	374
132	Via Computer	11
*	Warehouse Software	96
138	Wilcom	279
185	Winterhalter	61
211	X.D.S. Manufacturing	334
210	Zobex	244

PROGRAMMER'S GUIDE TO CP/M®

Edited by Sol Libes

Here's an important collection of CP/M insights that you'll never find in any CP/M manual. CP/M is the most popular microcomputer DOS in use today, and this widespread use has generated many innovative techniques and enhancements of CP/M. *Programmer's Guide to CP/M* tells you what these enhancements are and how to put them to use, how to get around apparent limitations of a CP/M system and why CP/M is far more versatile than you might have imagined. Every article in *Programmer's Guide to CP/M* originally appeared in MICROSYSTEMS between January 1980 and February 1982. Except for this collection, these articles are now unavailable! *Programmer's Guide to CP/M* gives you an in-depth look at CP/M from the viewpoint of the programmer—the individual who creates the software that interfaces directly with CP/M, or who is installing CP/M on systems for which configurations do not already exist.



Contents include "An Introduction to CP/M," "The CP/M Connection," "CP/M Software Reviews," "CP/M Utilities & Enhancement," "CP/M 86" and "CP/M Software Directories." 200 pages, $12.95.

CP/M is a registered trademark of Digital Research, Inc

MICROSYSTEMS PRESS Dept. NY3F **East Hanover Avenue · Morris Plains, NJ 07950**

Send me _____ copies of *Programmer's Guide to CP/M* at $12.95 each, plus $2 for postage and handling. =14C

Foreign orders (except Canada and Mexico) add $3 for postage and handling.

☐ **PAYMENT ENCLOSED $**_____ (NJ residents add 5% sales tax.)

☐ **CHARGE MY:**
☐ American Express ☐ MasterCard ☐ Visa

Card No._____ Exp. Date_____

Signature_____

Print Name_____

Address_____ Apt._____

City_____

State_____ Zip_____

For faster service,
CALL TOLL FREE: 800-631-8112
(In NJ only, call 201-540-0445)

☐ Check here for FREE catalog.

CA, NJ and NY state residents add applicable sales tax.

? HELP-WP

▶ATTENTION WRITERS:

BLACK & WHITE

▶ Allows user to see 12 PAGES OF LAYOUT ON THE SCREEN AT THE SAME TIME!
▶ Works with DOS format text files from most word processors and editors on the IBM PC, XT, & Jr..
▶ Configures to the major printer control commands of your word processor.
▶ Faster than printing—saves time and paper.
▶ An indispensable aid in formatting tables and illustrations.
▶ Print layouts on the Epson printer equipped with graphics option.
▶ Color · Graphics adaptor required.

25.00 check or money order
CHELSEA-SKYE
PO BOX 634
SOCORRO, NM 87801

CIRCLE 170 ON READER SERVICE CARD

COMPLETE YOUR LIBRARY OF PC



Add to your PC collection today. Make your personal library complete and authoritative with any issues you may be missing.

Copies are available for issues published during the last twelve months—be sure to specify the issues you want. If a particular issue is out of stock, your payment will be refunded promptly.

Back issues of PC are priced at $6.00 each, postpaid. Outside USA, $7.00 each.

PC MCBI
CN 1914, Morristown, NJ 07960
Please send issues of PC listed below:

Issue	Qty.	Unit Price	Total Price
		Payment Enclosed	$

Mr./Mrs./Ms. _____ (print full name)
Address _____
City/State/Zip _____

SOFTWARE DEVELOPERS

Save thousands of dollars! Save hundreds of hours!

by using our assembly language sub-systems

FABS

fast B-tree keyed access sub-system

- Rapid access and maintenance of large files with fixed-length records
- Versions available for CP/M-80, MP/M-II, CP/M-86, MS-DOS, PC-DOS, Microsoft BASIC(s), COBOL, FORTRAN, PASCAL, PL/I, CBASIC, CB80, CBASIC86, CB86.
- FABS directs all Access, Insert, and Delete file operations
- Key length may be greater than 50 bytes, and six key files open simultaneously
- Multiple primary key and multi-level key plus duplicate and variable-length keys are supported
- Random search time approximately 1 second, sequential step 1/4 sec.
- Deleted records are automatically reclaimed by subsequent insert operations
- Key files never need to be re-sorted: excellent error handling
- Generic search returns the first occurrence of partial key; search-next provides sequential read
- Loads resident with DOS, occupying less than 15k bytes
- Easy to incorporate into existing file-intensive applications
- Extensive commands: Create, Open, Close key file, Search (first, last, next, previous, generic), Insert, Delete, Replace key, Max Length, Open Deletes, # of Records, # of Keys

AUTOSORT

high speed Sort/Merge/Select sub-system

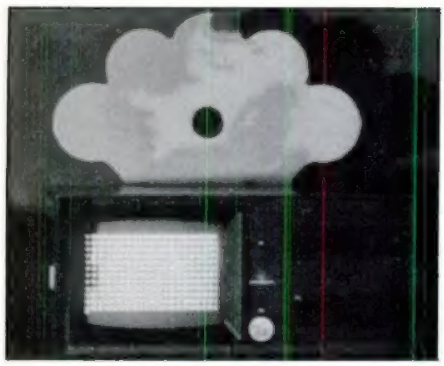
- Optimized for very large files; stand-alone or callable subroutine; diskettes may be changed during operation
- Versions available for CP/M-80, MP/M-II, CP/M-86 and MS-DOS, PC-DOS running Microsoft BASIC(s), FORTRAN, PASCAL, CBASIC, CB80, CBASIC86, CB86.
- Record size may exceed 5000 bytes, and file length is unlimited
- Sorts based on up to 10 fixed or variable length keys, each ascending/descending
- Key fields may be string, integer, single or double precision numeric
- Output files may consist of full records, key with record pointer, and record pointer only
- Select for retain/delete based on up to 4 keys, AND, OR, > < , =, conditions
- Single or multi-user; sorted files may be merged
- Fast . . . 4000 records of 128 bytes sorted to give key and pointer file is 170 seconds
- Boot straps itself into and out of memory claiming/restoring memory automatically
- Up to 9 different Sort/Merge/Select Modes of operation; parameters defined at run-time or read from a file
- Interactive parameter set-up program is supplied; files may be on disk drives A-Z

Retail Price $150 Each + Shipping (OEM Dealer Discounts)
COMPUTER CONTROL SYSTEMS, INC., 298 21st Terrace S.E., Largo, FL (813) 586-1886

CIRCLE 192 ON READER SERVICE CARD

The Independent Guide to IBM Personal Computers

Coming Up



Kaypro 4 Plus 88

Kaypro Corporation, makers of one of the more popular CP/M machines, has come up with a new model, the Kaypro 4 Plus 88, that runs both CP/M and DOS. Can one machine use both operating systems well? Does the Kaypro switch-hitter have anything else special to recommend it? *PC Magazine* will explore these questions from the perspective that counts most—yours.

Framework vs. Symphony

Watch from ringside as *Framework*, the latest windowing and integrated software package from Ashton-Tate, and *Symphony*, the newest offering from Lotus, battle for the World Championship of business software here in the pages of *PC*. We'll review the products, characterize them, and look at what they do—and what they don't do. Then our "panel of experts" will choose the winner of the heavyweight software title.

Project: Database, Part 5

PC looks at Category 3 (*dBASE II*-type) databases as we continue our review series of DBMS packages. As in the second category of databases, Category 3 packages can handle more than one file at a time and often feature a query language. But they are even more sophisticated since they can be programmed.

Professional and Business BASIC

PC will explore what makes these two versions of one of the oldest programming languages different from all other languages. What effect will Professional and Business BASIC have on program development and testing? What impact will Professional BASIC have on first time users?

Great Plains Software

The Price Waterhouse Report takes a look at another accounting package, this one an inventory management system for retailers, from Great Plains Software. In the past, few software developers have oriented their packages to the special needs of retailers who must update inventory figures at the point of sale. Does Great Plains Software have the answer to retailers' prayers?

PROGRAMMER'S GUIDE TO CP/M

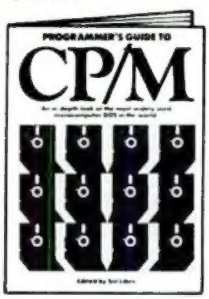
Edited by Sol Libes

Here's an important collection of CP/M insights that you'll never find in any CP/M manual. CP/M is the most popular microcomputer DOS in use today, and this widespread use has generated many innovative techniques and enhancements of CP/M. *Programmer's Guide to CP/M* tells you what these enhancements are and how to put them to use, how to get around apparent limitations of a CP/M system and why CP/M is far more versatile than you might have imagined. Every article in *Programmer's Guide to CP/M* originally appeared in MICROSYSTEMS between January 1980 and February 1982. Except for this collection, these articles are now unavailable! *Programmer's Guide to CP/M* gives you an in-depth look at CP/M from the viewpoint of the programmer—the individual who creates the software that interfaces directly with CP/M, or who is installing CP/M on systems for which configurations do not already exist.

Contents include "An Introduction to CP/M," "The CP/M Connection," "CP/M Software Reviews," "CP/M Utilities & Enhancement," "CP/M 86" and "CP/M Software Directories." $12.95.

For faster service, PHONE TOLL FREE:
800-631-8112
(In NJ only, 201-540-0455)

Also available at your local bookstore or computer store.



MICROSYSTEMS PRESS
Dept. NV6C 39 East Hanover Avenue
Morris Plains, NJ 07950

Please send me _____ *Programmer's Guide to CP/M* at $12.95* plus $2.00 postage and handling each. Outside USA add $3.00 per order. # 14C

☐ PAYMENT ENCLOSED $_____
*Residents of CA, NJ, and NY State add applicable sales tax.

☐ CHARGE MY:
(Charge and phone orders $10 minimum.)
☐ American Express
☐ MasterCard ☐ Visa

Card No. _____

Exp. Date _____

Signature _____

Mr./Mrs./Ms. _____
(please print full name)

Address _____ Apt. _____

City _____

State _____ Zip _____

☐ Send me a FREE *Creative Computing* Catalog

Copyrighted material

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



The VERSABUSINESS™ Series

Each **VERSABUSINESS** module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

CIRCLE 260 ON READER SERVICE CARD

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

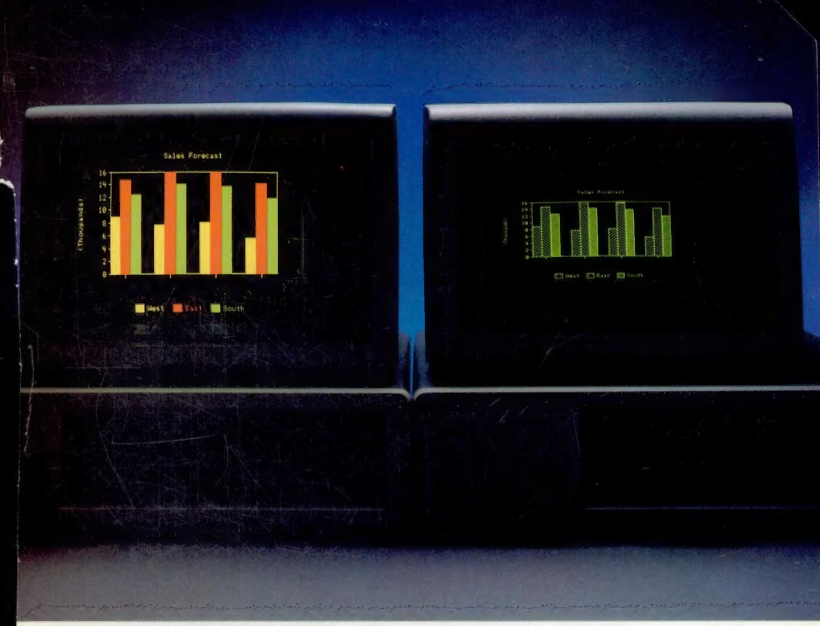
DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. · *APPLE is a trademark of Apple Corp. · *IBM is a trademark of IBM Corp. · *OSBORNE is a trademark of Osborne Corp. *CP/M is a trademark of Digital Research · *XEROX is a trademark of Xerox Corp.



The STB Graphix Plus™: an affordable way to put a whole new complexion on your IBM PC or XT.™

You get color or monochrome graphics plus a parallel printer port, all in one slot.

Our Graphix Plus multi-function video board gives you three of the most in-demand text and graphics capabilities for one very attractive price.

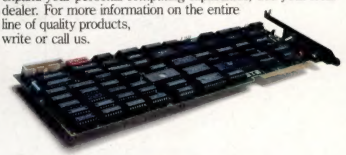
Graphix Plus includes functions for color or monochrome graphics and text displays, and a parallel printer. A clock calendar is available as an option.

This versatile board will drive an RGB color monitor or composite B&W monitor with the identical colors, resolution and modes as IBM's Color/Graphics Monitor Adapter. Graphix Plus improves on IBM's adapter with 50% faster scrolling, which eliminates annoying flashing and flicker.

Graphix Plus also drives the IBM monochrome display, in graphics and high resolution text modes, and is compatible with Lotus 1-2-3™, Microsoft Flight Simulator™ and other popular software. And, Graphix Plus provides for extended text capability.

Graphix Plus also includes a lightpen interface and PC Accelerator, STB's super ram disk emulator and print spooler program.

For a graphic demonstration of how Graphix Plus can expand your personal computing capabilities, see your local dealer. For more information on the entire line of quality products, write or call us.



Expanding Microcomputing

STB™

STB Systems, Incorporated

601 N. Glenville Avenue, Suite 125
Richardson, Texas 75081 / (214) 234-8750

IBM PC/XT is a registered trademark of International Business Machines Corporation.
Lotus 1-2-3 is a registered trademark of Lotus Development Corporation.
Microsoft is a registered trademark of Microsoft Corporation.
PC Accelerator is a registered trademark of ResCorp.

© 1983 STB Systems, Inc.

CIRCLE 430 ON READER SERVICE CARD

Copyrighted material

WHAT A PAIR !

Tecmar's Graphics Master™ & Lotus 1-2-3[1]

Graphics Master is the only board that creates *both monochrome* and *color* graphics for Lotus 1-2-3.
You can also run IBM compatible software because Graphics Master emulates both the IBM Color Graphics Adapter and the Monochrome Adapter.
We are pleased to announce that Graf-Talk[2] and MetaWindow[3] software take full advantage of Graphics Master's high resolution graphics.

Graphics Master is the only board that will do all of the following with appropriate software:

- **High resolution color graphics - 640 x 400, 16 colors**
- **High resolution monochrome graphics - 720 x 700**
- **Run software for IBM Monochrome Adapter**
- **Run software for IBM Color Graphics Adapter**



TECMAR
the power behind the PC

Tecmar Inc. 6225 Cochran Road Solon (Cleveland), Ohio 44139-3377 Phone:(216)349-0600 Telex: 466692

1 Registered Trademark of the Lotus Development Corp. 2 Registered Trademark of the Redding Group Inc. 3 Registered Trademark of the Metagraphics Corp.

CIRCLE 502 ON READER SERVICE CARD

Copyrighted material